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No. 3

COILED GAMBLING BASKETS OF THE PAWNEE AND OTHER PLAINS TRIBES

G. WELTFISH

THE gambling baskets used in dice games by Plains tribes are small coiled receptacles about six inches in diameter and two to three inches deep, of coarse workmanship and without woven decoration. Baskets of this type have been collected from a number of Plains tribes, among which are included the Pawnee, Arikara, Mandan and Hidatsa, several Dakota groups—particularly the Oglala,—the Cheyenne, Arapaho, Kiowa, and Comanche.¹

Baskets are not used in the daily life of these

¹ Appended is a list of some specimens in the collections of the Museum of the American Indian, Heye Foundation, from a number of these groups. See also *Aboriginal American Basketry*, by Otis T. Mason, *Report of the U.S. National Museum for 1902*, pl. 127 and pp. 378, 379, Washington, 1904.

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tribes; they are essentially non-basketmaking peoples. In fact, these small gambling baskets are the only baskets that have been collected from these groups save for the plaited burden baskets of the Arikara and Hidatsa.² Thus the question comes naturally to mind whether Plains gambling baskets were made by those who used them or whether in some or all of the cases the gambling baskets reached their users by trade. In any event, until the summer of 1929, I knew of no cases on record in which gambling baskets were definitely allocated to a particular basket-maker or were observed being made among any of these groups.

While among the Pawnee in the summer of 1929, I found that Pawnee women still made gambling baskets. Although I was among them both in 1928 and for four months in 1929, I was at first told only that gambling baskets had been manufactured many years ago but were no longer made. Later I interviewed three old women³ who had actually made these baskets and who still occasionally made them. One of these women

² In the dialect of the South Band Pawnee the coiled gambling baskets are called *káixT'su* and are distinguished from plaited baskets.

³ Annie Kelley-Knifechief, *Kłtkahaxki* band; Old Lady Lottie Fancy-Eagle, *PitahauiraT* band, and Old Lady Dogchief, *Skiri* band.

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(Old Lady Dogchief) was making the baskets for trade with neighboring tribes. Just before I left Oklahoma I was able to persuade one of these women to make a small gambling basket for me in my presence. The description of manufacture which follows is based on her procedure and what I learned from the others.

The Manufacture of a Pawnee Gambling Basket

Most Pawnee gambling baskets are made of willow. Young willow shoots are gathered in the spring, at which season they are pliable for working. For foundation the rods are peeled, while for sewing threads the young shoots are split. The surface of the willow gambling bas-

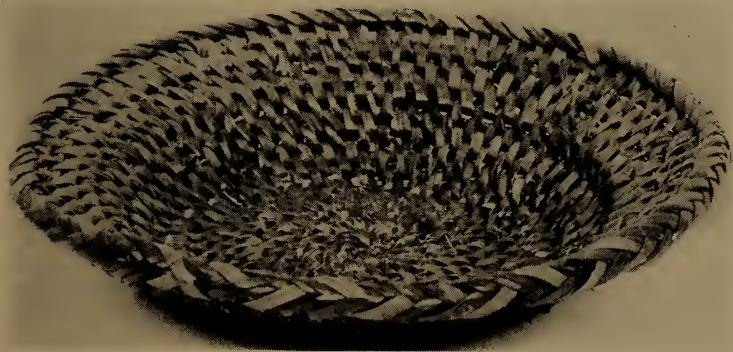


FIG. 40.—Pawnee gambling basket with willow sewing thread. Diam. $8\frac{3}{4}$ in. (14/1569)

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kets looks as if lacquered or varnished. This shiny appearance, however, is only the natural surface of the willow shoots (see fig. 40).

As I was among the Pawnee in the late summer and early autumn, it was at first impossible to persuade the old women to make baskets for me, as they claimed that at that late season of the year, all basket materials, and especially willow, would be too stiff to be worked. When I finally persuaded Annie Kelley-Knifechief to make a basket in my presence, she decided not to use willow, but other materials which she thought more pliable at that season.

When I came to see her I found that she had already gathered the materials and prepared a starting-knot. For the foundation she had secured cottonwood twigs (*raktariksusu*), and for the sewing thread, elm-root. The rods for the single-rod foundation were prepared from the cottonwood by splitting the twigs radially into three segments. The triangular rods which resulted were used apex upward. To get sewing thread, the outer layer of the elm-root was stripped from the hard center vertically in long threads. One end of each thread was taken between the teeth, the other in the left hand, and while the thread was held taut, the inner surface was scraped with a small vegetable knife in order

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to give the thread the desired thickness, and to remove such irregularities as knots and stubs. Then the bark surface was scraped. If desired, the bark could be removed, otherwise the bark surface was simply smoothed lightly with a knife.

The materials which Annie had prepared for the basket she made for me, she had left soaking over night in a dishpan filled with hot water. Such lengthy soaking may not be usual. But while in work all materials were left soaking in water until each individual piece was used. Just before being used, a thread was taken from the pan and further scraped. Where special irregularities appeared, Annie rested the thread on a small square of blue denim placed on her left thigh, and scraped the irregular places.

When she was ready to take up the work, Annie sat down on a straw (commercial) mat spread on the ground, with the right leg extended straight out in front, and the left leg, bent at the knee, placed under the extended right leg at a right angle with it.⁴ The materials which were soaking in a dishpan were placed off to the left side about on a level with the bent knee.

⁴ This sitting position is similar to that illustrated in *The Pima and His Basket*, by J. F. Breazeale, page 43, fig. 17, Tucson, Arizona, 1923. In the Pawnee position, the dishpan containing materials was placed off to the side instead of directly in front of the worker as illustrated.

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The starting-knot which Annie had ready, she had made by wrapping the end of the foundation rod around several times with sewing thread, the end of the rod being bent into a small circle, and a slip-knot made to fasten it. The second circuit was made by carrying the foundation-rod around in a clockwise spiral. The weaving was done at the far side of the circumference on the concave surface of the basket, the work proceeding toward Annie's right. Another type of starting-knot which is often used is made by twisting two strands of sewing-thread, watch-spring fashion, for the foundation of the starting-knot and the first few circuits. Then the foundation rod is whittled down and wedged between the two foundation threads, after which the rod is carried along as foundation for the rest of the basket.

Annie had carried her work up to the third circuit. The stitches of the first circuit of sewing (the second circuit of the basket) she had inserted in the center hole, giving a coil of double width at the center.

In sewing the following courses, Annie inserted a metal awl between the stitches and under the foundation rod of the completed course, making an effort to get non-interlocking stitches on the non-worksurface. When she allowed me to

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make a few stitches, I attempted to insert the awl so that the stitches would interlock, but she stopped me. She said this was incorrect as it would weaken the stitches. As the sewing thread would pass under the rod as well as through the stitch, this explanation is mechanically invalid. In a basket made by Old Lady Fancy-Eagle which she gave to me, the stitches interlock. This difference may possibly be accounted for by the different band affiliations of the two women (see note 3 above).

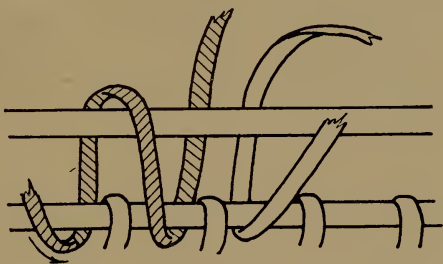


FIG. 41.—Thread-splicing: first step. (The old thread in hachure, the new thread plain.)

In making the basket, Annie used two methods of thread-splicing. In both methods the new thread is inserted in the awl hole and drawn

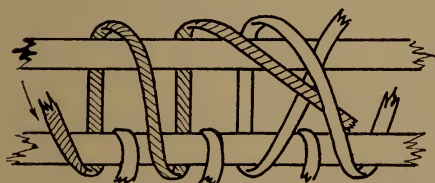


FIG. 42.—Thread-splicing: first method used by Annie Kelley-Knifechief.

away from the worker, the stub which is toward the worker being pressed up diagonally toward the right on the work-

surface (fig. 41). The stub of the old thread is then handled in one of two ways: in the first method, the stub of the old thread is carried

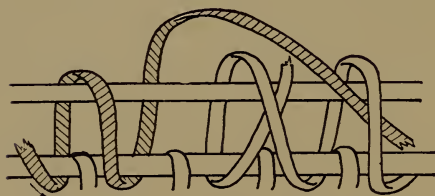


FIG. 43.—Thread-splicing: second method used by Annie Kelley-Knifechief.

over above the rod and bent down toward the right across the stub of the new thread. Both stubs are then fastened by the new stitch (fig.

42). In the second method, the stub of the old thread is left until the first stitch of the new thread is completed, thus fastening the new stub, and then the stub of the old thread is brought forward over to the work surface where it is fastened by the second stitch of the new thread (fig. 43).

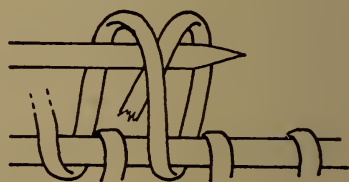


FIG. 44.—Finishing stitch used by Annie Kelley-Knifechief.

Annie sewed the rim of the basket plain in the same way as the rest of the body. The final fastening stitch is made by bringing the thread forward where it is drawn toward the left through the looped stitch. The stitch is then pulled

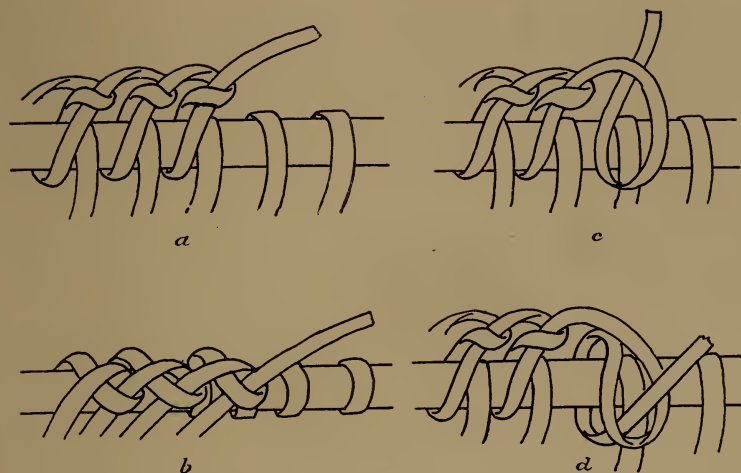


FIG. 45.—Pawnee braid edge used by Lottie Fancy-Eagle. *a*, Braid as seen from the concave surface. *b*, Braid as seen from above. *c*, First step in making a braid stitch. *d*, Second step in making a braid stitch before the stitch is drawn tight.

tight and the remaining thread is cut off (fig. 44). Annie remarked that there were several methods of decorating the rim with braided stitching which she illustrated roughly with thread (see fig. 45).

The basket given to me by Old Lady Fancy-Eagle was made by her and is one of the usual type made of willow.

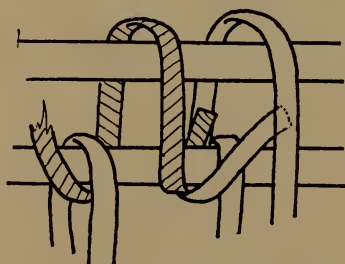


FIG. 46.—Pawnee thread-splicing used by Lottie Fancy-Eagle. (This splicing is used in the baskets shown in figs. 40, 48, 49.)

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It differs from the one just described in that the foundation is a single unsplit rod, the stitches interlock, and there is a braided rim (fig. 45). Still another type of splicing from those described is found in this basket (fig. 46).

Baskets of this usual Pawnee type can be seen in most museum collections.⁵

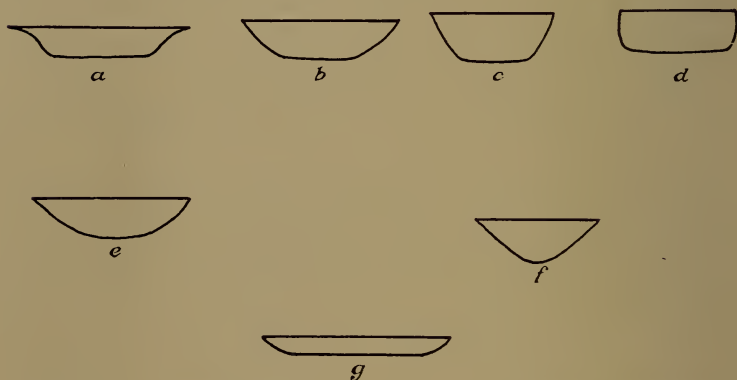


FIG. 47.—Shapes of Plains Indian coiled gambling baskets. *a*, Pawnee (14/1569); *b*, Cheyenne (11/5058); *c*, Cheyenne (11/3143); *d*, Arapaho (16/7210); *e*, Cheyenne (14/1590); *f*, Oglala (12/6131); *g*, Shoshoni (12/2103).

Comparative Data

All the coiled gambling trays of the Plains Indians are from six to nine inches in diameter and are small shallow bowl shapes, the walls varying from vertical to very oblique, with a

⁵ For example, Heye 16/7167, 14/1570, 14/1569 (fig. 40).

decided flare outward at the rim (fig. 47). Several kinds of wood or root materials are used for sewing thread; a few of the baskets are sewn with a fibrous leaf material, identified by Mason as *Yucca arkansana* (fig. 49).⁶

Looking down onto the rim of these baskets, in some specimens the coil proceeds in a clockwise spiral, while in others it proceeds in a counter-clockwise spiral. All the baskets collected from the Pawnee show a clockwise spiral. Of those collected from the Dakota, Northern and Southern Cheyenne, and Comanche, some are coiled in a clockwise spiral and some in a counter-clockwise spiral. So far as can be ascertained, all the baskets are worked on the concave surface. Those having a clockwise spiral are therefore worked toward the right of the worker, while those with a counter-clockwise spiral are worked toward the left of the worker. Thus the Pawnee baskets are all worked toward the right of the worker, while those collected from the other tribes vary, some being worked toward the right, while others are worked toward the left.

West of these groups are the Shoshoni and the Ute. The Shoshoni groups also use coiled gambling trays—large flat trays only very slightly

⁶ Mason, *op. cit.*, p. 379.

concave. While these differ decidedly in shape from the gambling baskets of the Plains, they are similar in texture and technique. The Shoshoni gambling trays all have a counter-clockwise spiral and are worked toward the left of the worker. Thus the Pawnee and Shoshoni baskets differ in the direction of work, while those of the tribes geographically between them show both directions of work, that characteristic of the Pawnee and that characteristic of the Shoshoni.

There appears to be no standard as to whether stitches interlock, do not interlock, or are split. Sometimes on the same basket all three varieties of stitching occur at random. This is unusual, as among most basket-making tribes only one of these methods is conventional.⁷ As can be seen above, there is a difference in this feature between the work of Annie Kelley-Knifechief and that of Old Lady Fancy-Eagle, both full-blood Pawnee and among the oldest women in the tribe. The Shoshoni show a higher degree of conventionalization in this feature than is characteristic of the Plains gambling baskets. For the greater part, stitches are split on the non-worksurface or stitches are non-interlocking. An irregular-

⁷ I have discussed this point, and other questions of conventionalization of technical traits, in my *Prehistoric North American Basketry Techniques and Modern Distributions*, to appear in the *American Anthropologist*.

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ity as to direction of work and manner of sewing is also found among the Paviotso Paiute of Walker River, Pyramid Lake, and Stillwater reservations of northern Nevada.⁸ The effect



FIG. 48.—Cheyenne gambling basket.
Diam. 9 in. (8/8370)

of this lack of standardization is seen in the coarseness and irregularity of surface both in the baskets of these Paviotso groups and in the

⁸ In the collections of the Museum of the American Indian, Heye Foundation, directions of work toward the right may be seen in 13/3814, 13/3815, and 13/3818 from the Pyramid Lake reservation, and in 13/4161, 13/4167, 13/4174, 13/4175, and 13/4176 from the Stillwater reservation. Work toward the left may be seen in 13/4423 and 13/4470 from the Walker River reservation, 13/4168 from the Stillwater reservation, and in 13/3813, 13/3816, 13/3817, 13/3820, 13/3821, 13/3822, 13/3823 from the Pyramid Lake reservation.

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Plains gambling baskets, which technically are by far the poorest coiled work in North America.

The foundation element of the Plains gambling baskets is a single rod (figs. 48, 49) or two-rod-vertical (fig. 40) foundation. This type of foundation is also used by the Shoshoni.



FIG. 49.—Arapaho gambling basket with yucca-leaf sewing thread. Diam. $6\frac{3}{4}$ in. (16/7210)

To summarize, it would seem that this distribution of gambling baskets with varying technical characteristics is open to two interpretations. In the one, they may be conceived as of two types—a Pawnee type and a Shoshoni

type. If this standpoint be taken, however, it will be seen that the two types would differ only in the actual direction of the work, that called the Pawnee type being toward the right of the worker, and that called the Shoshoni type being toward the left of the worker. In all other technical characteristics the same uniformities and variations occur in both types. And this interpretation is open to the objection that the distinction which is taken to define the two types appears within the work of the Paviotso Paiute almost as a characteristic of their technical methods.

In the other interpretation, the Plains gambling baskets can be considered a single technical complex which, owing to a lack of conventionalization and standardization in methods of manufacture, is subject to more than usual variation. The actual variations in technical traits of the Plains gambling baskets are distributed in a random way in relation to the distribution of the baskets themselves. This is what might be expected if the Plains gambling baskets constitute a single complex. If two or more technical complexes were represented in the distribution, we might expect to find particular technical variations, such as the direction of the

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work or the manner of sewing, distributed in a manner significant of the historical factors.

The dice games to which these baskets are an accessory have a wider distribution in North America than the Plains gambling baskets.⁹ The dice, which are of various shapes, sizes, and materials, are either thrown by hand and bounced on a stone or blanket, or tossed in a bowl or a basket. In addition to the Plains tribes I have mentioned, the only case in the eastern part of the continent of the use of the basket in association with such dice games is among the Cherokee of North Carolina.¹⁰ This is a "flat square basket of cane, like the lid of a market basket." Among the Algonquian and Iroquoian tribes of the eastern part of the continent, a wooden bowl is most frequently used. Most of these bowls are of the approximate size and general shape of the Plains gambling basket. Occasionally an oblong wooden platter is used, as by the Chippewa in Minnesota and the Yanktonai in North Dakota.¹¹ A single example of a round wicker-basket comes from the Chippewa

⁹ See S. Culin, *Games of the North American Indians*, 24th Annual Report, Bureau of American Ethnology, pp. 44, 225.

¹⁰ *Ibid.*, p. 105.

¹¹ *Ibid.*, fig. 46 and p. 185.

of North Dakota.¹² Of the Plains tribes, a wooden bowl is used by the Chippewa, Menom-
 ini, Sauk and Fox (of Iowa), Potawatomi (of
 Oklahoma), Osage, Winnebago, Yanktonai,
 Crows, and Assiniboin (of North Dakota and
 Montana). In the Plateau region, coiled bas-
 ket-trays are used for gambling by the Shoshoni
 of Wyoming,¹³ the Uintah Ute of Utah,¹⁴ and the
 Paviotso Paiute of Pyramid Lake, Nevada.
 The Washo of Nevada use a winnowing basket.¹⁵

In the Southwest, the Navaho of St. Michael
 and Chin Lee, Arizona,¹⁶ and the White Moun-
 tain Apache of Fort Apache, Arizona, use baskets
 in their dice games. The Zuñi use a wicker
 tray.¹⁷ A peculiar use of a basket in this con-
 nection is reported from Acoma:¹⁸ the basket is
 covered with deerskin and hung concave-side
 down and the canes are tossed against it so that
 they fall beneath it on a blanket spread on the
 ground. From the Southwest there is also a
 prehistoric wooden cup from Grand Gulch,
 Utah.¹⁹

In the Oregon-California region, large flat
 trays have been reported from the Klamath, who

¹² *Ibid.*, fig. 48.

¹³ *Ibid.*, fig. 216.

¹⁴ *Ibid.*, fig. 221.

¹⁵ *Ibid.*, p. 199.

¹⁶ *Ibid.*, pp. 93, 96.

¹⁷ *Ibid.*, pp. 224, 304.

¹⁸ *Ibid.*, p. 120.

¹⁹ *Ibid.*, p. 48.

have an overlay-twined tray which is used also for drying seeds in the sun.²⁰ Large flat coiled trays are also reported from the Southern Miwok,²¹ of Yokuts type, and from the Mono and Yokuts of southern California.

The use of a square tablet of leather has been reported from the Tlingit and Haida;²² and a disc of thick rawhide has been reported from the Arapaho in Wyoming.²³

These comparative facts summarize the North American distribution of the use of artifacts in association with dice games.

*Plains Indian Gambling Baskets in the Museum
of the American Indian, Heye Foundation*

<i>Tribe</i>	<i>Catalogue number</i>	<i>Diameter (inches)</i>
Pawnee.....	16/7167	9½
Pawnee.....	14/1570 (willow sewing thread)	9¼
Pawnee. Fig. 40	14/1569 (willow sewing thread)	8¾
Oglala (Dakota).....	12/6131	6½
Arapaho (Okla.). Fig. 49.	16/7210 (yucca-leaf sew- ing thread)	6¾
Arikara.....	16/7299	6⅞
Cheyenne.....	12/6394 ²⁴	6

²⁰ *Ibid.*, p. 331, fig. 438.

²¹ *Ibid.*, fig. 163.

²² *Ibid.*, p. 130.

²³ *Ibid.*, figs. 15, 17.

²⁴ This is an unusual basket, sewn with yucca-leaf thread on a multiple-grass foundation. The plaited type starting-knot, now found only among the Pima, is also present in this specimen.

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<i>Tribe</i>	<i>Catalogue number</i>	<i>Diameter (inches)</i>
Cheyenne.....	10/4483 (yucca-leaf sewing thread)	7 $\frac{1}{8}$
Cheyenne.....	11/3143	6
Cheyenne.....	14/1589	7 $\frac{3}{4}$
Cheyenne.....	14/1590	8
Cheyenne.....	10/1954	7 $\frac{1}{2}$
Cheyenne.....	8/8369	7 $\frac{1}{2}$
Cheyenne.....	11/5058	8 $\frac{3}{4}$
Cheyenne.....	10/4484	8 $\frac{1}{4}$
Cheyenne. Fig. 48.....	8/8370	9
Pima (small tray used by Cheyenne)	12/3097	

THE PARAPHERNALIA OF THE DUWAMISH "SPIRIT-CANOE" CEREMONY—*Continued*

T. T. WATERMAN

Ceremonial Objects

Painted Planks.—The statement has been made to me by Boas and by my Indian informants that the various tribes had each its own form, and Haeberlin's article says the same. It seems that at least three forms (fig. 50, *a-c*) can be distinguished.

In the manufacture of these planks a trench was cut across a cedar log. Then a slab was split off, and hewn to shape with the hand-adz so much used by these Indians. When the surface was smooth enough, the paint was

applied: first a coat of white, then various figures in red and black. In recent years a good many blue figures occur, painted in wash-bluing; in



Fig. 50.—Diagram representing the form of the Spirit-canoe planks as used by (a) the Suquamish, (b) the Duwamish, (c) the Snohomish people.

the old days these people had no blue. Of the aboriginal colors the white (*sta'-weyûq^w*) was a kaolin which they dug out of the swamps and burned. The black was charcoal (*p^ee-tet*). Red pigment was of two sorts: a yellowish red pigment, called *xe'-qwetL*, was

made of ochrous clay (*le^eqtld*) dug up in certain localities; a very true and brilliant red, more commonly used, was made by gathering a fungus (probably *Ganoderma tinctorum*) from hemlock logs. Lumps of this material, which is very

hard, were dried, scraped down, and mixed with rotten salmon-roë. This pigment was called *xala'lsid*. The paints used on these plank figures, especially the white, which is applied with water merely, rub off very readily, a fact mentioned by Dorsey.

I can speak only of the symbolism of Dorsey's specimens, the Tacoma specimens, and those collected by myself. I had no opportunity to make inquiry about the American Museum specimens or those preserved at the Field Museum. First, as regards the outline of the object. Dorsey remarks that the type of plank shown in fig. 50, *b*, represents a cetacean. A complete drawing of a specimen is shown in fig. 51. Dorsey points out



FIG. 51.—Specimen of a painted plank for the Spirit-canoe. There is a noteworthy resemblance between the painted figure which represents a cetacean, and the outline of the plank.

the presence of painted eyes and remarks that the carved section at the top represents a snout with teeth. It is a fact that information concerning these planks is difficult to procure. There is a certain amount of inherent reasonableness about Dorsey's idea, for the *painted* design unquestionably suggests a cetacean with flukes, flippers, tongue, teeth, and a dorsal fin, and certainly has an outline very much like the outline of the plank (fig. 50, *b*). My own information, however, is that the *form* of the plank represents a certain mythical monster which drew people from a distance into its maw by sucking its breath. It is known as Skeba'kst, and many myths are told in relation to it. Concerning the painting on this particular plank, I got another story altogether, namely, that it represents a creature half salmon and half bird. This animal is the offspring of Thunder, and can be induced to swallow one's diseases. The disease is represented by the small horizontal stroke in front of the snout; the carved design is the rainbow. It is not impossible that different animals or monsters are represented by very similar outlines, for the carving in any case is crude. The planks were never used more than once, except as noted below, a new set being made for the next occasion. The carved work is

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therefore schematic. The painted designs, which are more easily made, are more carefully and graphically done, and therefore more easily recognized.

The type of plank represented by fig. 50, *c*, is said to portray a spirit of enormous strength, who appears in human form. This being is called *StL^ooEbs*, and was described by my informant as a "gorilla" man. One informant suggested that the form shown in fig. 50, *a*, resembled a certain type of ceremonial object discussed below.

Dorsey gives *stlalcopschudoptch* (not translated) as the word for these slabs. The first part appears to be *stLa^oa'lkab*, "carved figure." The word *schudoptch* he gives later as the word meaning cetacean, and also a creature half otter, half fish. It suggested to my informants *sxu'datc*, a certain spirit-helper, which can make a man twist up, if a shaman is offended at him. I could not get my informants to offer any other suggestion concerning Dorsey's word.

The part of the plank which is bent over at the top is called *zE'dis*, "snout." This is armed with teeth (*sE'dLs*). In some cases a line is drawn between the rows of teeth, representing the tongue (*tLa'lap*). The painted circle is *ka'lob*, "eye." Sometimes two eyes are shown

on the same side of the plank, in defiance of anatomy, even the anatomy of spirit-helpers. On all these planks there are painted dots, arranged in various ways. Dorsey notes their presence, but is uncertain what they mean. My informants tell me that they represent the songs revealed to the shaman by the particular guardian-spirit whose likeness is pictured in the middle of the plank. Every type of guardian-spirit was addicted to songs of a definite and recognized pattern, so that a bystander could recognize what type of guardian-spirit a man had, merely by hearing him sing. These dots are called, therefore, *sxo'xod*, "songs." The black border around the edges of the plank is termed *ecwa'uq*, "container of the power." The figure in the center, whether human being, animal, ceremonial object, or whatever it may be, is the spirit-helper and is called the *ba'kab*, "traveler," for it is this supernatural helper (to give the systematic theology of the process) which actually makes the journey to the underworld; the shaman meanwhile "acting out" the part in the dance-house, sharing in the perils of the journey, or the evil consequences of it, as one might say, vicariously; and incidentally, pocketing all the fees. The *ce'gwiL*, or colored area, beneath these figures, represents the ground.

Painted Designs in the Center of the Planks.—The next point to be considered is the painted designs on these planks. I give herewith a list of the designs appearing in Dorsey's engravings, in the order in which they there occur, with some additional information obtained by myself.

Fig. 52.—A design called *schudoptch*, not translated, but supposed by Dorsey to be "some cetacean." This word has just been discussed, being probably identical with a word *sxuda'tc*, recorded by myself, meaning a kind of spirit-power which can twist a victim into a knot.

Fig. 53.—A different design, also called *schudoptch* (compare fig. 66).

Fig. 54.—A design resembling, according to Dorsey, the end of a dwelling house, called *stalcoppiacabu* according to our author, "meaning the cedar-board people." This painting represents in reality a certain ceremonial object made of plank with hand-holds in the side. Power entered these things during certain ceremonies, and

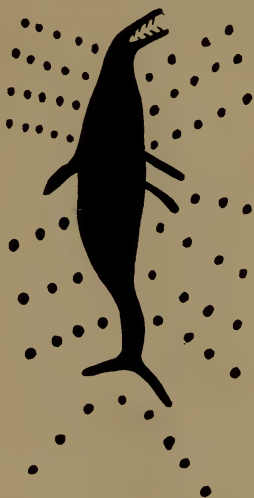


FIG. 52.—Painting representing a supernatural helper, known probably as the *sxuda'tc*. (After Dorsey)

they dragged people about, causing them to quiver and shake. The particular term for this object is *skudi'litc*, and a specimen collected in 1920 and now in the Museum of the American Indian, Heye Foundation, will be shown later. All Duwamish ceremonial objects, however,



FIG. 53.—Painting representing a supernatural helper, known also as the *sxuda'tc*. (After Dorsey)

are referred to as “cedar - board people,” *xpai-Ekbi^w* (*xpai*, cedar). This is the *piacabu* of Dorsey's term. The term *stLa^ε-a'lkab* means

“carved figure.” The term Dorsey quotes is therefore, in my orthography, *stLa^εa'lkab-xpai-Ekbi^w*, “carven

cedar people.”

Fig. 55.—The two large figures in this painting are “certain birds which inhabit the nearby lakes and streams, called *swokut*.” This term is



FIG. 54.—Painting representing a supernatural helper. The object is a section of plank with hand-grips. The spirit power which enters these planks is called *skudi'litc*.

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evidently *cwo'kwEt*, "loon." The small object "is said to be a fish, *chebwhoop*." This latter term is probably *tce'bxub*, "splashing" or "playing" in the water. This may well be a mythical term for the mud-puppy or salamander,



FIG. 55.—Painting representing loons. These birds were the source of an important "power."



FIG. 56.—Painting representing a powerful being known as Štsa'iek. The curved line represents his "house."

which appears in a later drawing (fig. 57) in much the same outline as here.

It is worth noticing, I think, that the "songs" which surround these birds are represented in

rather a picturesque way as dropping from their wing-feathers.

The painting on the next plank is practically identical with No. 54 above, so I do not reproduce it. Dorsey gives the name as *stlalcop-shalatut*. The first element in this word is the *stLa⁸a'lkab*, "carven figure," already mentioned. The second part is a word meaning a certain type of spirit-power, and the objects into which this power enters, given by Haeberlin as *skla'letut*. Dorsey's expression, *stlalcop-shalatut*, would therefore be in my orthography *stLa⁸a'lkab-skla'letut*, translated literally "carven spirit object."

Fig. 56.—The painting on the next plank representing a human figure is called by Dorsey *Tseiak*, and the curved design, *allala-Tseiak*, "home of Tseiak." This latter word is in my orthography *Stsa'iEk*, a term applied to a certain spirit-power which enables a man to be a great hunter or fisherman, or a successful canoe-builder. Dorsey's word *allala* is evidently connected with *alt*, "house."

Fig. 57.—These painted figures are called by Dorsey *wuwuhchudab*, not translated. The circles, however, are said to represent the eyes of the mud-puppy (salamander). The latter part of this word is evidently Haeberlin's *x^udab*,

the spirit-power which enables a man to become a shaman and visit the underworld. The whole expression means "mud-puppy spirit-helper,"

and the animal being unquestionably the mud-puppy or salamander, in the native dialect, *swu'wu*.



FIG. 57.—Painted figure representing mud-puppies (salamanders). The large circles are eyes of salamanders.

My informants say that the mud-puppy "has a nice face, like a person."

Fig. 58.—As remarked by Dorsey, the next painting conspicuously resembles No. 55 above, but was said to represent a female shaman (*skaquis*). The only word for "shaman" at all resembling this term that I can find is *stL'a'bats*, "sucking-



FIG. 58.—Painting representing a female spirit, perhaps the spirit who gives power to "sucking-doctors," carrying drumming-poles, and covered with a blanket, represented by the curved line.

doctor." The object she bears in each hand is said by Dorsey to be a dance-wand, which he calls *teched*. This word (in my orthography, *te'stid*) is not a dance-wand, but a long drumming-pole, punched up against the roof-boards in time to a song. The word for dance-wand

is *tw!o'sid*. The curved line is said to be *setsabp*, "a blanket" (*si'tsab*, in my orthography, a word applied to any kind of a blanket of dog-wool or skins).

Some additional designs, found on the Ferry Museum specimens, were examined in company with a native informant, and the following paintings were identified:



FIG. 59.—Painting probably representing an earth-spirit, posed as a "sucking-doctor" in a characteristic dance.

Fig. 59.—This figure represents a class of supernatural beings which live in the ground. They are called *swaxti'utid*, "earths," or *swawati'utid*, "little earths" or earth beings. The nature of

these beings is discussed below. This interesting little figure is represented in a posture which is characteristic of a dancing sucking-

doctor. Shamans who assume the power of curing disease by sucking accompany their dancing by certain gestures. They first put one forearm across the forehead while with the opposite hand they rub the thigh or hip, alternating as they dance.

I am unable, of course, to tell where the Indian obtained this spirit, or what the spirit's name was. That could be learned only from the man who made the painting, for it represents his own inward and subjective experiences.

Fig. 60.—This drawing is intended to represent a certain species of duck, the male of which has a red head. The species is called *swixitc*. The short solid line extending between the two ducks represents sickness, which the ducks "are trying to draw from a patient."

Fig. 61.—This figure was identified by one informant as the sea-lion, *cās*, a very powerful "helper." My informant knew nothing about the speci-



FIG. 60.—Painting representing a pair of ducks. They are in the act of swallowing "sickness," which is represented by a short straight line.

men figured by Dorsey, which had been made by Doctor Jack on Cedar river, years before my visit. The drawing is almost exactly similar to



FIG. 61.—Painting said to represent the sea-lion, or the "child of thunder," a being half bird and half salmon.

pl. 64 of Dorsey's paper (our fig. 52), and the presence of the dorsal fin would make one think rather of the porpoise or even perhaps the killerwhale, rather than the sea-lion. A very similar painting was explained as representing a spirit that was part salmon and part bird, which also belonged to the same Dr. Jack. The latter figure, practically identical with the one illustrated herewith, was said to be *bEdE-hweyEqwadi*, "the child of thunder." It is accompanied by a curved design (not shown in our illustration) representing the rainbow (*kuba'tcLd*).

Fig. 62.—The larger of these drawings is said to be the salmon. The bird at the bottom is the swamp-robin (*sia'q*), the spirit helper of Jerry Kenim's father. The perpendicular lines represent the surface and the bottom of the water.

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The line near the salmon's mouth is the "sickness" which it is biting and removing.

On a set of planks obtained by myself, some designs occur which are similar to the ones I have

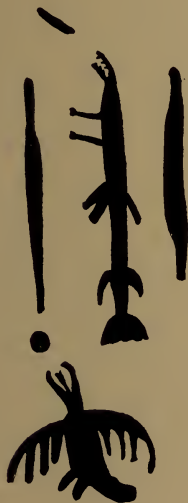


FIG. 62.—
Painting representing the salmon (a-b) and (below) the swamp-robin.



FIG. 63.—
Painting representing the salmon, the solid line being the salmon-eggs.

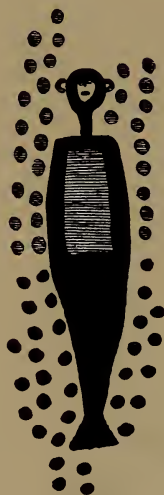


FIG. 64.—
Painting representing a sea-man, an immortal race which dwell under the ocean.

already listed. The painted board with hand-holds, for example, is a favorite theme for artistic representation. The following additional designs were, however, explained to me:

Fig. 63.—This figure, painted in red, represents the salmon. The black line (fuzzy in the illustration) represents salmon-eggs. The arrangement of fins is inaccurate, but might be reconciled with the facts. Thus the anterior one of the large fins on top might easily represent the dorsal fin of the salmon, while the second might represent the adipose fin. The first pair on the underside would in this case be the paired pectoral fins, while the second pair would represent the ventral fin.



FIG. 65.—Painting representing the porpoise, locally known as the "black-fish."

Fig. 64.—This drawing, which occupies one face of the plank, represents a sea-being, described as a "merman" by the younger Indians. The native term for this class of beings is *bEti'l*. I obtained several mythical tales in which they figure, and the idea of sea-people who live under the waters is clearly aboriginal. This, however, is the only case I know of in which they appear in art. Whether this way of representing them with the head and body of a man and the tail of a fish, is purely native or not, I cannot say.

Fig. 65.—This figure is the por-

poise, or "blackfish," called *kwsiu'*⁸, the opposite side of the plank being occupied by a water-dog.

Fig. 66.—This drawing is on the reverse side of the plank just mentioned, and shows one way of representing the water-dog.



FIG. 66.—Painting representing the "water-puppy" or salamander. The drawing is somewhat different from the salamander of fig. 57.

Fig. 67.—This is a representation of the common whale, *qwa'di*. There is certainly little to distinguish this from the drawing of a salmon. It is, in fact, somewhat curious to note the vagueness and uncertainty of the artists of this region, as compared with the absolute mastery exhibited by the tribes of British Columbia, only a few hundred miles away. A comparison of the paintings on the sets of planks which I have had an opportunity to examine makes it clear that four classes of spirit-helpers are



FIG. 67.—Painting representing the common whale.

particularly important, the *skudi'lite* spirit rep-

resented by the board with hand-holds, the loon, the mud-puppy, and various kinds of sea-animals—a quaint assortment certainly.

(*To be concluded*)

A VANISHED LANGUAGE OF A VANISHING INDIAN PEOPLE

RUDOLF SCHULLER

THE southern part of the Republic of Colombia, especially the departments of Cauca and Nariño, is, both ethnologically and linguistically, the least known of that country. Indeed much of Colombia in several other respects continues to be almost untrodden land, as for instance the rich *Kulturlager* in the Department of Caldas¹ and adjacent territory.

With regard to the Indian languages of southern Colombia we have the useful work by H. Beuchat and Dr. Paul Rivet, wherein is to be found an almost complete list of what hitherto

¹ Elsewhere I have referred to the collection of Indian gold objects, perhaps the richest extant, and the precious archeological collection in possession of Don Santiago Vélez in Manizales, Caldas. Photographs of the former are preserved in the Museum of the American Indian, Heye Foundation.

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has been written on the Paniquita, Coconuco, and Barbacoa linguistic stocks.²

During a brief sojourn in Popayán, the his-



FIG. 68.—Barbacoa Indians of Santiago, Nariño, Colombia, in native dress.

² See *Affinités des langues du sud de la Colombie et du nord de l'Equateur* (Groupes Paniquita, Coconuco, et Barbacoa), par H. Beuchat et P. Rivet, *Extrait du Muséon*, Louvain, J.-B. Istas, Éditeur, 86, Rue de Bruxelles, 1910; 94 numb. pp. See also *Les Familles Linguistiques du Nord-Ouest de l'Amérique du Sud*, par P. Rivet, *Extrait de l'Année Linguistique*, tome iv.—1908-1910, Paris, Librairie C. Klincksieck, 11, Rue de Lille, 1912, pp. 117-154.

toric capital of the Departamento del Cauca, I had the opportunity to meet some of those Indians on several occasions while they were



FIG. 69.—Fernando Jacanamishói and his cousin Domingo Quinchóá, both native of Santiago, Nariño, Colombia.

on their way to Bogotá. Most of them were native of Santiago, a little Indian village situated not very far from Pasto, capital of the department of Nariño. Gaining a livelihood by agriculture, they are under the spiritual direction of a so-called "Padre Prefecto," who, so far I could understand from the In-

dians, is one of the Spanish Capuchin missionaries of the monastery in Pasto. It may therefore be taken for granted that most of the original customs of these Indians have well-nigh vanished. Alien influences one may observe in their costume, as for instance, their woolen "poncho"-cloak,³ which must have been adopted



FIG. 70.—Typical garments of the Baracoa Indians of Santiago, Nariño, Colombia. The leather sandals show alien influence. (Photo by the author at Popayán.)

³ See *Le vrai poncho, son origine postcolombienne*, par Gösta Montell, *Journal de la Société des Américanistes de Paris* (Reconnue d'utilité publique), Nouvelle série, tome xvii, pp. 173-183, Paris, 1925.

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from the neighboring Quechua-speaking Indians, or perhaps from Spanish settlers. Of strictly Indian origin, however, are the great number of strings of beads, sometimes of wild seeds, worn around the neck; and the same may be said of the mode of dressing the hair, which is of typical forest-Indian fashion. Physically they are truly representative of the average type of forest Indians.



FIG. 71.—Chief Francisco Jansasói and some of his Barbacoa tribesmen of Santiago, Nariño, Colombia. (Photo. by the author at Popayán.)

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The mother tongue of these Popayán people was a dialect of the Mocoa-Barbacoa branch; but it seems to be no longer spoken by them. Most of them now speak Quechua, a language which, as is well known, Spanish conquerors and missionaries spread throughout the land from the time of its discovery and conquest.⁴ I

⁴ Note the advance of the Spanish conquerors and missionaries in the northwestern part of what now is the Argentine Republic. Quechua gradually became the tongue of the Diaguita-Calchaquí Indians, whose mother tongue, the *Caca-Kaka*, became forever lost.



FIG. 72.—Pedro López of Silvia, Departamento del Cauca, Colombia. Note the curious shape of the native straw hat. (Photo. by the author at Popayán.)



FIG. 73.—A newly married couple of Silvia Indians feasted by their kindred.

met some of them who could read and write in Spanish. A short glossary which I was enabled to record shows affinity with the words published under the names of "Moguex" and "Totoró" by Brinton.⁵

Those of the younger generation communicate entirely in either Quechua or Spanish, hence in all probability the name of the language of these Indians must be added to the already long list of vanished American Indian tongues.

The same fate will soon be met by the Indians of Silvia and Guambío, other villages situated in the neighborhood of Popayán. They speak a dialect similar to Paniquita, although most of them are *ladinos*. Only a few words of their language remain, and not the slightest vestige of their primitive life, except the characteristic straw hats which they still manufacture and wear. Most of them use the Spanish language and have adopted the manners and customs of the neighboring mestizos and criollos.

Os-bío, Gua-bío, Tim-bío, Pam-bío, Pasam-bío, Guaju-bío, Cali-bío, and others, are place-names in the Guambío language; and as such they constitute strong proof of the former greater geographical extension of these Indians, who within a relatively short time will be partly

⁵ Brinton, Daniel G., *The American Race*, p. 347, 1891.

extinguished and partly absorbed by advancing civilization.



WAMPUM COLLECTION

GEORGE G. HEYE

AN INTERESTING collection of wampum objects of Mohawk origin has generously been presented to the Museum by Blair S. Williams, Esq., one of its Trustees. They consist of the following:

A belt of white beads with two stripes of purple beads (fig. 74). This is a covenant belt and was early used in a treaty with the English, the agreement being that both parties should travel

FIG. 74.—Mohawk wampum belt. Length, $33\frac{1}{2}$ in. (17/5205)

by separate but parallel paths (the two stripes of purple beads), the Indian by canoe and the white man by his boat, neither interfering with the other except in the case of murder or robbery.

A fragment of a very wide belt of white beads, edged with purple beads (fig. 75). Said to be part of the great white wampum belt *Skanodah-korah-kowah* given by Dekanawida, cofounder with Hiawatha of the Iroquois League, at the time of its formation in the fifteenth century. When the Onondaga were attacked by the French and Mohawk, they lost some of their belts, of which this was one, and ever after the

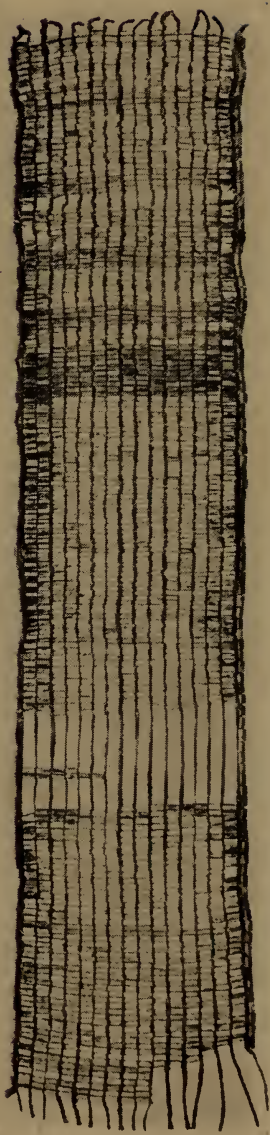


FIG. 75.—Fragment of Mohawk wampum belt from Brantford, Ontario.
Length, 25 in. (17/5206)



FIG. 76.—Five strings of Mohawk wampum tied together.
Length, 35 in. (17/5208)

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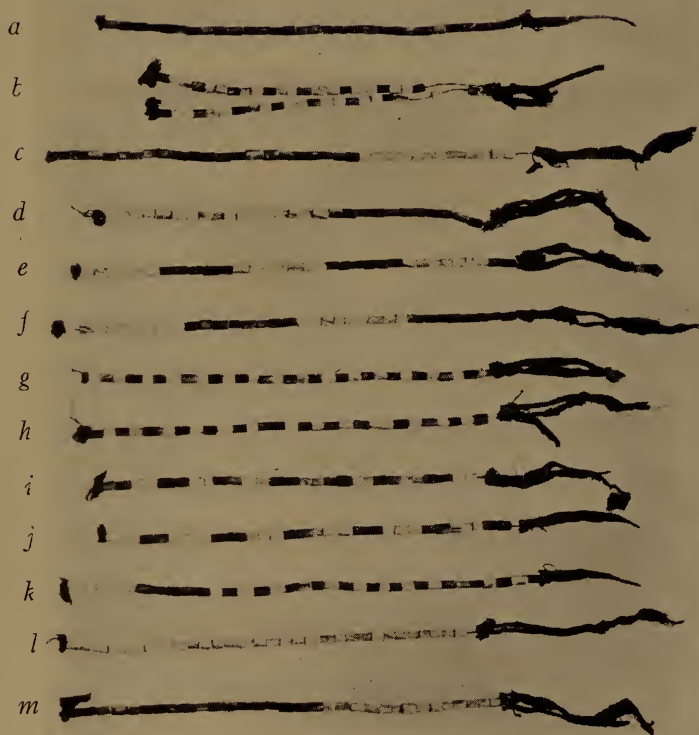


FIG. 77.—Wampum strings used in Mohawk Condolence ceremony. Length of *c*, 11½ in. (17/5207)

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Mohawk refused to surrender them to the Onondaga.

Five strings of white wampum tied together (fig. 76). This was an emblem of authority for opening the councils of the Five Nations, each string representing one of the nations. This specimen must have been used before the Tuscarora were admitted to the Confederacy in 1722.

Thirteen short strings of white and purple wampum used in the Condolence ceremony immediately after the death of a chief, and which was subsequently followed by the "Thirteen Ceremony," called "At The Wood's Edge" (fig. 77). Each string was used to recall a paragraph of this ceremony. They are lettered from *a* to *m* in the order in which they were thus employed.

NOTES ON INDIAN TEXTILES OF CENTRAL CHILE ¹

SAMUEL K. LOTHROP

WHEN the Spaniards first entered Chile they found the same tongue spoken from the Rio

¹ A preliminary report on a phase of the studies conducted by the author for the Thea Heye Expedition of the Museum.

Choapa to Chiloe island—a distance of about 800 miles. However, these Indians were not a unit in physical type nor culture nor government; in fact they were split into innumerable small independent communities, each with its own name. One of these tribal names, Araucanian, has come to be applied to all Indians in the region mentioned, owing to the literary success enjoyed by the poet Ercilla. Modern anthropological usage confines the term Araucanian to the language only.

As a result of the resistance to the colonial and republican governments the Araucanian-speaking Indians have had to present a united front. This has led to fusions in culture, so that the original divergences have largely disappeared. But these differences are revealed in the archaeology and in many details of present arts and industries.

Recent students, in order to classify the many tribes, have invented names to cover more or less homogeneous groups. These are:

I. PICUNCHE: "people of the north," including tribes from the Rio Choapa to the Rio Itata. As tribal units they are extinct, but some of the blood and some of the industrial arts survive today.

II. MAPUCHE: "people of the land," including

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tribes from the Itata to the Rio Imperial. These number over 100,000 today. They differ in physical type from the Indians to the north and south, and the current theory is that they invaded Chile not long before the conquest.

III. HUILICHE: "people of the south," the tribes from the Rio Imperial to Chacao channel. There are about 20,000 of them. The culture has become much Mapucheized.

IV. The CUNCO are a subdivision of the Huilliche who lived between Osorno and Puerto Montt.

V. The CHILOTE are Cunco who entered Chiloe and amalgamated with or drove out the now extinct Chono.

Mapuche Textiles

1. *Chamal*: the woman's robe. This is a square of cloth, usually dyed dark-blue, edged with red, and has tassels at the corners. It is wrapped around the body under the arms, and the free end is brought over the shoulder and secured with a pin. In the north it is pulled over both shoulders and secured with two pins (which are usually joined by a silver gorget).

2. *Chiripa*: the men's breechclout. This is a piece of cloth exactly like the *chamal*. It is wrapped around the waist like a skirt; the back

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edge is pulled between the legs and up to the abdomen; it is held in place by a belt. This garment is now rarely seen.

3. *Iculla*: a shawl worn by the women. To-day this invariably is European and machine woven. It is said that the ancient native type was like the *chamal* and had no woven designs. If so, this is very different from the shawls of the Huilliche and Chilote, which have simple patterns.

4. *Trarihue* (belt): both men and women wear belts, which are both tightly woven and at times elaborate in pattern. Commonly there are two major designs in the center, and these are flanked by two, three, or four minor patterns. The ends are fringed. Sometimes the major motives are geometric, but usually they are highly conventionalized life forms. One of the commonest seems to be a development of the plumed-serpent motive and can be traced northward to Canada via the Chavín stone, Chiriqui "alligator," etc. Such patterns are probably pre-Mapuche, i.e. they were developed in Chile by the Huilliche before the invasion of eastern plainsmen. Other designs show resemblance to painted motives from Patagonia.

5. *Poncho*: the poncho is used today in Chile not only by Indians but by all people who live

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in the country. As one would expect, there are several classes, each with a special name.

A.—*Macuñ* means a poncho in general, and, more specifically, a poncho without decoration. Such ponchos are very common and sometimes beautiful owing to the dyes. Many shades are obtained by mixture of black and white wool.

B.—*Nequer macuñ*: this means a poncho with woven decoration, of which there are three general types. One or more of these decorative techniques may appear in a given textile.

I.—*Huirican macuñ*: a poncho decorated with bands of alternate colors. This is an ancient type, and probably the *iculla* had the same adornment.

II.—*Nimiñ macuñ*: ponchos with bands woven in the *trarihue* or *lama* (see below) technique. These are the most elaborate and expensive of the ponchos. They are worn only for dress occasions and only the rich can afford them.

III.—*Trarican macuñ*: tie-dyed ponchos. These also are rare and expensive, although the patterns produced by this technique are simple. Usually they are blue with the design showing in white, but occasionally they are red or

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some other color. The last two types mentioned correspond roughly to the chief's blanket among the Navaho. They form perhaps two percent of the total ponchos.

6. *Pontro*: this is a blanket, used today for sleeping. It is perhaps a development from the now extinct *iculla*. Decoration is limited to stripes.

7. *Lama*. The textiles described have to do with the person, while those to follow have to do with the horse. However, they evidently come down from pre-European times, when they were used to sit on in the house.

The *lama* is a saddle-blanket placed *under* the saddle so that it can scarcely be seen, yet it is extremely elaborate in both weave and design. The peculiarities of the former result in typical elaboration of the latter. These patterns in part show rather definite relationship with Diaguita motives in northern Chile.

8. *Choapino* (*chañantuco*): a pile-woven saddle-blanket placed *over* the saddle-frame. These are in almost general use today, but have been greatly commercialized owing to their use as rugs. There are several distinct varieties, each with its appropriate name. The primitive form had long strings all over, because it was not

possible to trim them until scissors were introduced. This is the only kind I have collected, because the ones with designs are a completely modern development with aniline dyes, and are both ugly and expensive. I have never seen a *choapino* with a pattern among the Mapuche, although the Cunco and Chilote use them frequently.

9. *Kutama*: saddle-bags. They are woven in the *lama* technique and therefore are very elaborate. They have different designs on front and back.

10. *Slings*: Mapuche slings are always made of braided wool, sometimes in contrasting colors.

11. *Frenteras*: these are small belts (with the usual belt technique and decoration) tied across the head-band of the bridle.

Picunche Textiles

To the north of the Mapuche lived a group of Araucanian-speaking people (whom they had displaced) known as the Picunche. Although the language has disappeared, the blood has become mixed, and the people do not regard themselves as Indians, yet certain aboriginal textiles are still common. Technically the chief distinction between Picunche and Mapuche weaving is the common use of imbricated pat-

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terns among the former. That is to say, patterns are made by a secondary weave on the upper half of the warp threads at the same time as the weft is placed, so that the resulting design appears in relief on one side only of the cloth. This technique reappears south of the Mapuche again among the Huilliche, Cunco, and Chilote. Among the Picunche it is used on ponchos and blankets.

It should be noted that the Mapuche *lamas* have raised designs showing on one side only, but they are produced by a totally different technique.

Huilliche Textiles

The *chamal* and *chiripa* are of the Mapuche type, but are very rarely seen today. The Huilliche make shawls with simple patterns, and sometimes *lamas* and *choapinos*, but usually these are bought from the Mapuche. They weave belts, and I have two ponchos woven in the belt technique. In general the ponchos are striped in simple colors.

Cunco Textiles

For the greater part Cunco textiles are identical with those of the Huilliche. There is a development of *choapinos*, probably modern,

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made with native patterns and dyes, which are actually used on the saddles.

Chilote Textiles

These again resemble the Huilliche, but there is much more frequent use of imbricated weaves with elaborate designs. In recent years the old patterns have been abandoned for European designs taught in the schools.

DYES

Many of the vegetal colors used by the Mapuche and the Chilote are not what we think of as "good Indian," but they come from the native plants and are in common use. However, pinks, greens, grays, etc., occur in pre-historic Peru, and it is quite possible that they were known in pre-Columbian times in Chile. The dyes employed by these two groups are listed in the table following.

The result of the great variety of dyes is two-fold. In the first place, by blending it is possible to obtain practically any color or shade desired. Secondly, it is difficult to detect the aniline dyes, of which many are now commonly used. This is especially true of the pinks, purples and greens.

MAPUCHE DYES

Color	Name of plant	Part used	Botanical name
Gray	chilco	shoots, branches	Fuschia macrostemma, R. P.
Slate-gray	nalca	root	Gunnera chilensis, Lam.
Violet-gray	romasa	shoots, leaves	Rumex romassa, Remy
Violet	maqui	fruit	Aristotelia maqui, L'Hér.
Violet-blue	—	bark (?)	Blagiobothrys tinctoria, D. C.
Blue	—	—	Chiroptetalum lanceolatum, Juss.
Green	canelo	leaves	Drimys winteri, Forst.
Green	{ yelfcun	leaves	Solanum gayanum, Remi
	{ tihue	leaves	Laurelia aromatica, Spr.
Green	califate	leaves, bark	{ Berberis congestiflora, Gay
	—	(a lichen)	{ B. Darwini, Hook.
Olive-green	—	wood	{ B. heterophylla, Juss.
Lemon-yellow	michay (califate)	wood	Telocchystes flavicans, Sw.
	—	wood, bark, leaves	Berberis (three species; see above)
Yellow (?)	coigüe	wood (?)	Boldoa fragrans, Gay
Yellow	pitra	wood	Nortofagus dombeyi, Mirb.
Yellow-ochre			Eugenia multiflora, Hook.

MAPUCHE DYES—(Continued)

Color	Name of plant	Part used	Botanical name
Ochre	muermo (ulmo)	bark	Eucriphia cordifolia, Cav.
Yellow-brown	pelai	branches	Muhlenbeckia thamnifolia, Meisn.
Orange	romasa	rhizomata	Rumex romassa, Remy.
Light-brown	tihue	bark	Laurelia aromatica, Spr.
Brown	lingue	bark	Persea lingue, Nees.
Dark-brown	radal	bark	Lomatia obliqua, R. Br.
Yellow-red	—	(a lichen)	Usnea florida stringosa, Ach.
Brick-red	quintral	flower	{ Loranthus Sternbergianus, L. { L. heterophyllus, R. P.
Red	relbun	(a lichen)	Ramalina yemensis, Ach.
Red	pellin	root	Relbunium hipocarium, Hemsl.
Rose-crimson	pellin	bark	Nortofagus obliqua, Mirb.
Dark-crimson	huique (Deu)	wood	N. obliqua, Mirb.
Black	cochayuyo	shoots	Coriaria ruscifolia, Feuillée
Black	—	charcoal (of fungus)	Durvillea utilis, Bory.
Green-black	maqui	leaves, branches	Aristotelia maqui, L'Hér.

CHILOTE DYES

	michay (califate)	bark, shoots, roots	Berberis (three species: see above) Nortofagus antarcticus
Lemon-yellow	roble	flower	
Sunburst yellow	apple	shoots	
Henna	{ cadillo miñumín	leaves	
Beige	palguin (matico)	leaves	
Golden-beige	canelo	flowers	
Rose-beige	bunque (huique?)	bark	
Cocoa-brown	muermo (ulmo)	bark	Drimys winteri, Forst. Coriaria ruscifolia, Feuillée Eucryphia cordifolia, Cav. Lomatia obliqua, R. Br. L. obliqua, R. Br.
Mustard	radal	green bark	
Mustard-brown	radal	old bark	
Van Dyke-brown	{ robo coal maqui radal	—	Aristolelia maqui, L'Hér. Lomatia obliqua, R. Br.
Black		—	

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SKELETAL REMAINS FROM TEXAS

BRUNO OETTEKING

DURING the summer of 1929, Mr. E. F. Coffin of the Museum undertook an investigation of a number of burial sites in western Texas.¹ Beginning with a brief survey of a rockshelter site in which Mr. M. R. Harrington had previously worked in a cañon called by him by its earlier name of Eagle cañon, but which he refers to as Bee Cave cañon, Mr. Coffin proceeded thence to Satan cañon, where he continued his excavations. The skeletal material herein briefly described comes from these two sites, No. 891 being from a rockshelter $3\frac{1}{4}$ miles northeast of Bee Cave cañon, at Chalk draw, Brewster county, the others from the Satan cañon rockshelter, Markward ranch, about 25 miles northwest of Del Rio, Valverde county. The general data pertaining thereto are presented in the accompanying Table I.

As indicated, the skeletons are fairly complete and in a fair to good state of preservation. Nos. 894 and 895 are skulls only, the latter a calvar-

¹ See *Indian Notes*, vol. VI, no. 4, pp. 407-411, October, 1929.

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TABLE I

Catalogue No.	Age	Specimen	State of Preservation	Remarks
891	senile	skeleton	good	Also fragmentary bones of a fetus
892	senile	skeleton	good	Burial no. 1
893	mature	skeleton	fair	Burial no. 2
894	senile	cranium	good	Burial no. 3
895	mature	calvarium	good	—

ium, i.e., without its lower jaw. It will be observed that the five individuals whose bones are tabulated were of mature to senile age, which accounts for a certain porosity of the bones, the primary stages in general of osseous atrophy carried to an extreme in the lower jaws, and for the more or less developed arthritic degeneration, particularly in the vertebral joints. Two notable cases, one of arthritis in a metatarso-phalangeal joint, and the other, through periostitic degeneration, of concrecence of the right metacarpalia iii-v, obtain, besides spondylitic deformations, in No. 892. These two cases are illustrated in fig. 82.

The osseous relief in the longbones is not strongly pronounced, but the platycnemic condition of the tibiæ in various degrees of development are of significance from the Indian diag-

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nostic point of observation. Judging by visual calculation and leaving for a future time the



FIG. 78.—Norma frontalis of skull 895.

metrical investigation of the longbones and their proportional evaluation, the skeletons reveal

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approximately medium statures of their erst-while owners.



FIG. 79.—Norma frontalis of skull 891.

The skulls number five, four of them crania and one a calvarium. As expressed by their

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absolute dimensions, they are of good size, except the female skull (No. 894) which falls short in its principal dimensions by comparison with those of the males. The individual measurements are listed in Table II, where it will likewise be seen that the cranial modules, according to the formula $\frac{L + Br + H}{3}$, range from 150.0-153.7

TABLE II

Measurements	891 ♂	892 ♂	893 ♂	894 ♀	895 ♂
	senile	senile	ma- ture	senile	mature
Cranial	<i>mm.</i>	<i>mm.</i>	<i>mm.</i>	<i>mm.</i>	<i>mm.</i>
Length.....	191	185	183	177	189
Breadth.....	128	136	137	125	130
Height.....	131	140	132	122	132
Module.....	150.0	153.7	150.7	141.3	150.3
Min. front. cr.....	95	88	88	85	93
Facial					
Height.....	71?	70	72	65?	73?
Breadth (bizyg.)...	132	144	137?	—	135
Nasal height.....	54	51	53	54	56
Nasal width.....	31	25	27	27	29
Orbital height.....	34	34	33	34	34
Orbital width.....	43	44	44	43	42
Indices					
Length-breadth....	67.0	73.5	74.9	70.6	68.8
Length-height.....	68.6	75.7	72.1	68.9	69.8
Breadth-height.....	102.3	102.9	96.4	97.6	101.5
Transv. par. front..	74.2	64.7	64.2	68.0	71.5
Upper facial.....	53.8	41.7	52.6	—	54.1
Transv. cran. fac...	103.1	105.9	100.0	—	103.9
Nasal.....	57.4	49.0	50.9	50.0	51.8
Orbital.....	79.1	77.3	75.0	79.1	80.95



FIG. 80.—Norma lateralis of skull 895.

mm. in the male skulls, while the female reaches only 141.3 mm. If compared with group averages for Eastern Indians² extending in the males from 152.2-160.4 mm. and with that of 148.9 mm. for the San Miguel island series in the Museum, it will be seen that the Texas skulls occupy a medium station. Our female skull of 141.3 mm., on the other hand, falls short of both the Eastern Indian range of 146.4-150.0 mm. and the San Miguel island average of 142.6 mm. The most extraordinary feature, however, in the present skulls, is their marked dolichocrany, which in two of them (891, 895) even attains hyperdolichocranial status. The marked length of our crania furthermore is of decisive influence in the length-height proportion where with two exceptions the indices are chamaecranial, while in the exceptions (892, 893) the marked lengths are matched by greater height extensions. The cranial breadth, distinctly small in a general physiological range of from 101-173 mm., has a decided influence in the transverse parietofrontal and craniofacial indices, rendering three crania stenometopic, one mesometopic, and one eurymetopic, which latter,

² *Hrdlička, Aleš*, 1916. *Physical Anthropology of the Lenape or Delawares, and the Eastern Indians in General*, *Bull. 62, Bur. Amer. Ethnol.*, p. 118.



FIG. 81.—Norma lateralis of skull 891.

however (No. 891), with a larger minimum frontal breadth of 95 mm., exceeds all the others. The transverse craniofacial index, besides the narrowness of the skull, is, in turn, decidedly influenced by the bizygomatic breadth, which is quite high in a general physiological range of 100-155 mm., and which also is the cause of conspicuous phænozygy. The upper facial index is illustrative of medium high faces except in No. 892 whose extreme bizygomatic breadth renders its face euryenic. The noses show a tendency toward chamærrhiny, and the orbits are truly mesokonchial with one chamækonchial exception.

The skulls, which have been briefly accounted for metrically here, exhibit pronounced type differences as revealed in figs. 78-81, presenting skulls Nos. 891 and 895 in *normæ frontalis* and *lateralis*. Both being hyperdolichocranial, it will be noted in *norma frontalis* of No. 895 that from the broad bizygomatic basis, which is further emphasized by the broad display of the zygomatic bones and their acute angular approximation toward the frontal plane, the cranial contour tapers into a pronounced crest of the cranial vault, the so-called *crista sagittalis*. This feature is considerably less expressed in No. 891, which also shows a narrower display

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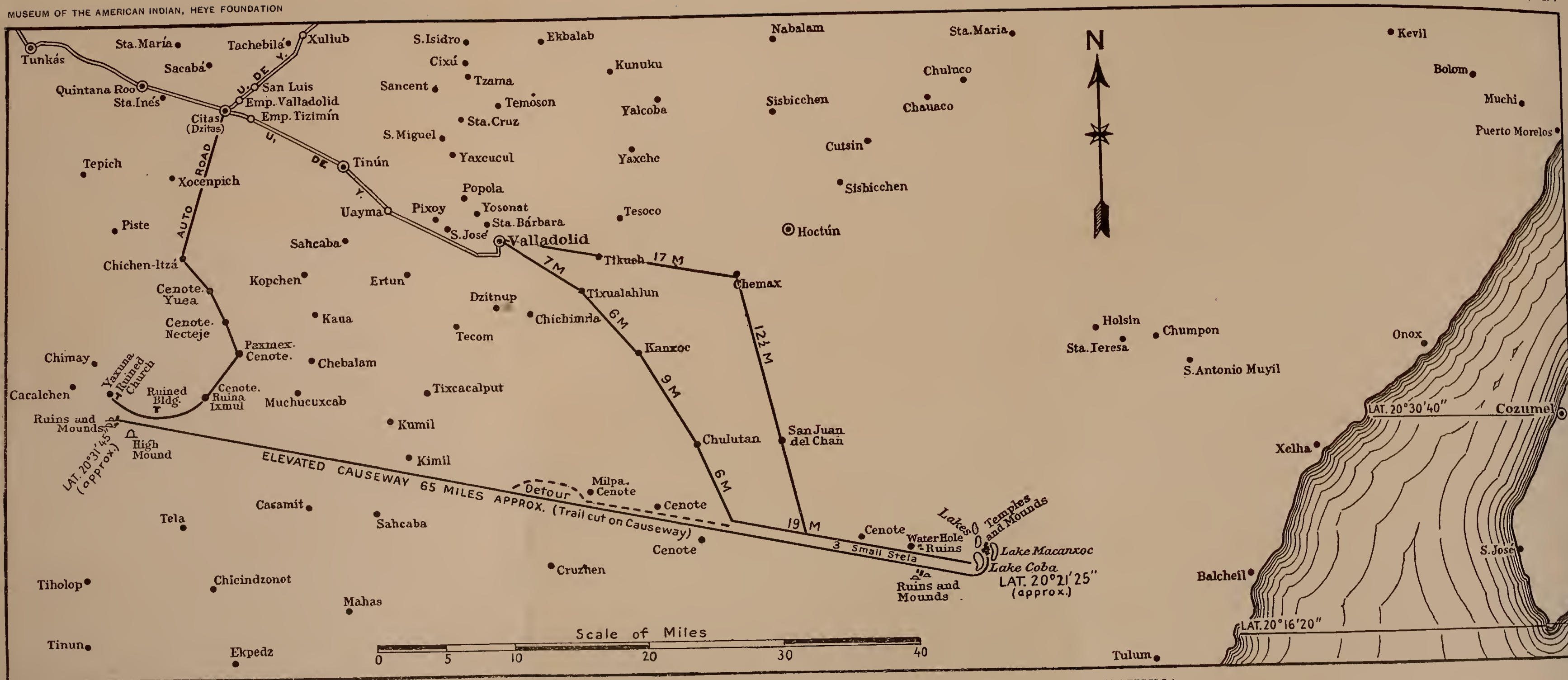


FIG. 82.—Fused hand and foot bones of skeleton 892.

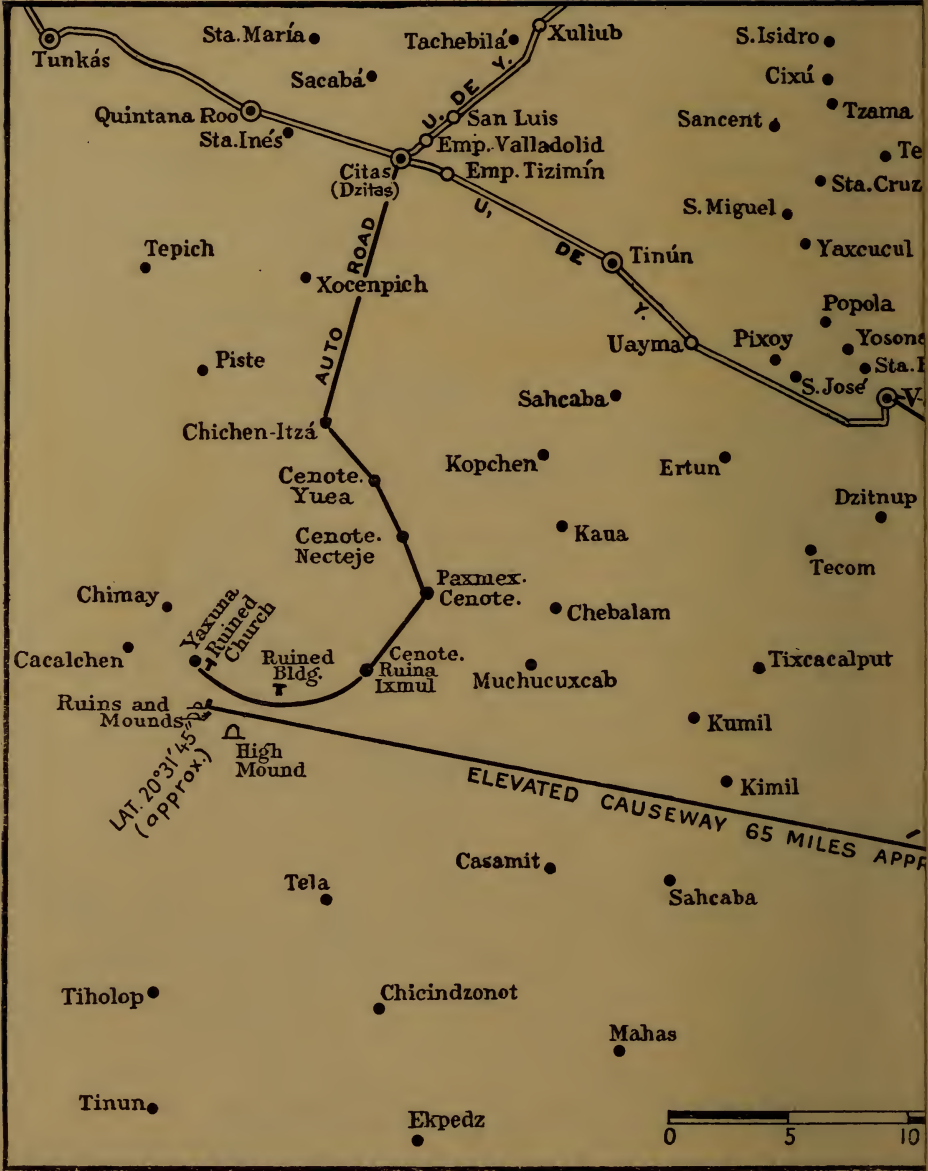
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of the zygomatic bones, i. e., giving the impression of a somewhat narrower face and a more evenly vaulted transverse vertical contour. The crista sagittalis is of typical occurrence in the eastern Eskimo and the Australian, and at least one of the Lagoa Santa specimens of the Copenhagen collection; but while the Eskimo has a leptorrhinic piriform aperture, the Australian is chamærrhinic, which would correspond to the decidedly chamærrhinic conditions in our two specimens. Of more advanced morphological standing in these specimens are the well developed canine fossæ. The alveolar ridges, it will be observed, are strongly atrophied.

The most striking feature in norma lateralis is the sharp flexure of the occiput in No. 895, and the resulting almost horizontal course of the inion-opisthion stretch of the occipital outline. The condition here is intensified by the presence of a well developed torus occipitalis. The occipital outline is much more rounded in No. 891, and the entire lateral contour is more evenly elliptic and rather coincides with *G. Sergi's* *ellipsoides rotundus*, while No. 895, a type of decided morphological inferiority, signifies a pronounced type of *ellipsoides sphyroides*. Traits of further interest are the high course of



MAP SHOWING THE COURSE OF THE ANCIENT CAUSEWAY FROM COBA TO YAXUNA



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the temporal lines and the smallness of the mastoid processes in No. 895.

Differences of type are an indubitable indication of heterogeneous group composition. Our small series comprises three specimens coinciding with the type of No. 895, and two with No. 891. But, although differing in cranial contour, they all represent the dolichocranial skull form and as such the Southwestern representatives of dolichocrany in contrast with the Northern or, still more distinct, the Northeastern, dolichocranial area.

THE ANCIENT MAYA CAUSEWAY IN YUCATAN

ROBERT R. BENNETT

WHEN Colonel Charles Lindbergh, in February, 1929, was flying from Belize, British Honduras, to Havana, along the east coast of Yucatan, he observed what he afterward described as "two green eyes" looking up at him. These were two of the larger lakes in the vicinity of Cobá, a colossal pile of ancient temples and ranges of buildings estimated to be from fifteen to twenty centuries old. This adventure in-

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trigued Colonel Lindbergh into an interest in Mayan archeology, developing later the idea of searching from the air the peninsula of Yucatan and northern British Honduras.

The only allusion to these pre-Columbian ruins is the statement contained in a translation from an ancient aboriginal Mayan document called *U Kali Katunob of Chumayel*, as follows: "When the plague attacked the people of Chichen Itzá, they migrated to the east and arrived at the settlement of the priest Cobá." This brief statement is the first in all history suggesting the possibility of Cobá having been a religious center, and since many stone causeways have been found to radiate from it, it is now often regarded as a "religious hub" from which the causeways lead in all directions with possibilities of their ending in the ruins of "Old Empire" cities. One of the objects of the Lindbergh flight was to trace one of these causeways known to run westward to no-one-knew-where. The failure of Dr. Kidder and Mr. Ricketson to see the causeway later traversed by me, although they flew over it twice, is ascribable alone to the dense jungle of the country and not at all to their powers of observation.

"Slow and laborious travel," write Messrs. Kidder and Ricketson in the *Geographical*

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Review,¹ "a hot, humid climate, swarms of insects, and prevalence of tropical diseases have greatly retarded exploration in the Maya country." The advent of the airplane for scouting and transport will accelerate the work, but the men on the ground must still struggle against a ponderous weight of vegetation, against a nature so fertile and lavish that it clings, and engulfs, and shuts off the view, and from the archeologist's point of view must be considered hostile. Only a few years ago there were Indians to contend with as well, for descendants of the ancient Maya had too many bitter memories of the white man to be anything but hostile. Here industry came to the aid of science. Chicle became an important commercial product of Quintana Roo. Mule-trains began to penetrate the thick virgin forests in search of the raw material, and the Indians who gathered it were converted from enmity to friendship for the white man. Our efforts of last January and February, suggested by Dr. Kidder of the Carnegie Institution and Director George G. Heye of the Museum of the American Indian, Heye Foundation, formed the first exploration of the transport phase of the ancient Maya civilization.

Only a few years have elapsed since archeo-

¹New York, April 1930, p. 178.

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logists challenged the very existence of old stone roads in Yucatan. We are indebted to Prof. Marshall H. Saville for the following information extracted from his brief paper on the subject in *Indian Notes* for January, 1930.

Two of the earliest and most important historians of Yucatan, namely Diego de Landa and Bernardo de Lizana, mention them, and brief notices of their existence have been made by explorers in the nineteenth century.

It seems highly probable that as early as a thousand years ago a broad highway extended a considerable distance across the northern part of the peninsula of Yucatan, if indeed it did not reach from the eastern to the western shores of the country.

When the Spaniards first entered this part of Middle America during the first half of the sixteenth century, they found the country in a state of decadence. They established their capital, to which they gave the name of Merida, on the site of an ancient and important native city called Tiho. To the east of Merida, the town of Izamal was founded on the site of a very important Mayan city known as Ytzamal.

Bishop Landa, writing during the last quarter of the sixteenth century, described the multitude of edifices in Yucatan, noting the extensive groups of Tiho, Ytzamal, and Chichen Itza. Of Ytzamal he noted that "there is no memory of their builders, who seem to have been the first [inhabitants of the land]." He stated also that Tiho and Ytzamal were about thirteen leagues apart, and said, "There are signs even today that there was once a very handsome causeway from one city [Tiho] to the other [Ytzamal]." ² He further wrote that Tiho belonged to a period as ancient as Izamal. From Bishop Landa's statement we know that the causeway was in a ruined condition three hundred and fifty years ago. . . .

Madame Le Plongeon wrote that they saw between

² Diego de Landa, *Relación de las Cosas de Yucatan*, p. 330, Paris, 1864.

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the village of Mucuiiche and Izamal, on the left of the road, "the remnants of the magnificent ancient causeway, carefully built of hewn stones, cemented with mortar, which, at the time of the Spanish conquest, existed between Izamal and T.-Hó (Mérida). A great part of this work has been thoroughly destroyed to obtain stones to macadamize the public road." ³

A few years after Landa wrote his history (not known or published until 1864), Lizana, in describing the "idols which were venerated in the town of Ytzamal when the land was conquered," wrote concerning the importance of the town in the religious life of the Maya as a place of pilgrimage, saying: "There they offered great alms and made pilgrimages from all parts [of the province], for which reason there had been made four roads or causeways to the four cardinal points (*vientos*), which reached to all the ends of the land, and passed to Tabasco, Guatemala, and Chiapas, so that today in many parts may be seen pieces and vestiges of it. So great was the concourse of people who assisted [at the ceremonies] to these oracles of Ytzamat-ul and Tiab-ul, that they had made these roads." ⁴ Here again we have the statement that the roads were in ruin a short time after the Spanish conquest, and trustworthy information concerning their vast extent.

During the last four years attention has been drawn to the hitherto unexplored city of Cobá, which lies to the eastward some seventy miles in the jungle as the trail runs from Chichen Itza. From what little we now know of Cobá it appears that this place was one of the largest and most important of ancient Maya cities. In 1842 the famous explorer Stephens, when at the frontier town of Chemax, on the road from Chichen Itza to Cobá, was shown by the cura of Chemax a report which he had drawn up relating to his curacy of Chemax, which included all the territory to the eastward as far as the sea. Stephens copied and translated the portion concerning the ruins of Cobá and the causeway leading from it. In this report

³ Alice D. Le Plongeon, Notes on Yucatan, *Proc. Amer. Antiq. Soc.*, p. 80, Worcester, 1879.

⁴ Bernardo de Lizana, *Historia de Yucatan* (1633), new ed., p. 4v, Mexico, 1893.

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is described a large two-story edifice called the Monjas, followed by the statement: "From this edifice there is a *calzada*, or paved road, of ten or twelve yards in width, running to the southeast to a limit that has not yet been discovered with certainty, but some aver that it goes in the direction of Chichen Itza." Stephens adds: "The most interesting part of this, in our eyes, was the *calzada*, or paved road, but the information from others in the village did not interest us. The cura himself had never visited these ruins; they were all buried in the forest; there was no ranch or other habitation near; and as our time was necessarily to be much prolonged by the change we were obliged to make, we concluded that it would not be advisable to go and see them."⁵

In later times, Charnay, on his visit to Yucatan in 1880, wrote, "We also have found marks of a cemented road from Izamal to the sea facing the island of Cozumel,"⁶ and he places Cobá in approximately its correct position on his map, although he does not mention the site in his text. Some forty years ago Teobert Maler saw this ancient causeway running to Cobá; he visited the ruins and made a few pictures, but he kept his knowledge to himself, issuing no publication recounting his visit.

In 1891 my interest in ancient roads had been aroused during the months I was engaged in excavation at the ruins of Labna, for I had to cross daily an ancient causeway extending six hundred feet from the Palace to the Temple. This road was in an advanced state of ruin, and was not more than twenty-five feet wide and about four feet in height.⁷ On the expiration of my work at Labna, my friend Don Antonio Fajardo, in Ticul, urged me to undertake a trip to Chemax in order to investigate a great ruined city which he stated was near a large hacienda owned by him, some distance to the east of Chemax.

⁵ John L. Stephens, *Incidents of Travel in Yucatan*, vol. II, pp. 340-341, New York, 1843.

⁶ Désiré Charnay, *Incident Cities of the New World*, p. 308, New York, 1883.

⁷ Marshall H. Saville, *The Ruins of Labna, Yucatan*, *The Archaeologist*, vol. I, no. 12, p. 232, Waterloo, Ind., Dec. 1893.

As Maler lived in Ticul and was on very friendly terms with Don Antonio, it is probable that Cobá was the ruined city referred to and that Don Antonio had been told of it by Maler. However, only in recent times has it been safe to go into this region, as the Indians of Chan Santa Cruz were in control of the country, and no extensive explorations could have been carried on.

There is another road which unites Cobá with Kucican, a ruin which we found some ten miles to the south. For a number of miles of this distance the road has an elevation of six to seven meters. Near Kucican there are various passages made under the road, constructed with the typical Maya roof of the ancient. These tunnels would permit travelers to go from one side of the road to the other without having to climb over them. A short distance from Cobá this same road unites with another which seems to come out from the sacred ward of Macanxoc. The roads come together, forming an angle of 35 to 40 degrees, and in the angle forming this junction is a small ruined building.⁸

Our expedition of the Museum of the American Indian, Heye Foundation, undertook the task of ascertaining the destination of this old causeway, in which we were successful. Two important "Old Empire" sites are linked by this causeway, namely, Cobá at the eastern end and Yaxuna at the western, both cities being in a ruined condition. Our objective was not the exploration of these two cities, although both were visited and a number of observations made.

On January 11, 1930, I left Valladolid, accom-

⁸ J. Eric Thompson, *Comunicaciones y Comercio de los Antiguos Mayas, Anales de la Sociedad de Geografía é Historia de Guatemala*, tomo VI, núm. 1, pp. 40-44, Sept. 1929.

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panied by the late Crawford Johnson, of Washington, D. C. We had an Indian guide, a muleteer, and four *bracheros* to blaze a trail through the jungle. Passing through the Indian villages of Tixualahtun, Kanxoc, and Chulutan



FIG. 83.—Ruins of an ancient church at Chulutan.

(fig. 83), the trail encountered the ancient causeway and for about nineteen miles it alternately leaves and joins it until the ruins of Cobá are reached. The causeway had been previously explored for this distance, but that portion extending westward from its junction with the

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Chulutan trail was virgin territory for the explorer and the archeologist. The earliest date of the thirteen stelæ found at Cobá is equivalent to 364 A.D., hence it is fairly evident that the causeway was built somewhere near that period. The structure is thirty-two feet wide and approximately sixty five miles in length, ending at the ruins of Yaxuna, which site is about seven miles south of Chichen Itzá as the crow flies, but by trail a good eighteen miles. The road is so constructed that it runs level by means of retaining walls two feet thick at the top and wider at the bottom, buttress style, the height being from two to ten feet according to the configuration of the terrain. The surface may be slightly convex; but this is difficult to ascertain on account of the heavy growth of bush, as the trees are continually casting up rubble in irregular heaps.

The highest retaining wall we saw is eight or ten feet, where the trail from Chemax meets the causeway about five miles east of the Chulutan trail. The masonry there is in better condition than any I saw elsewhere. The stones are of all sizes, the largest, generally at the bottom, weighing many hundreds of pounds, and being from two and a half to three feet in length. The upper layer of stones, while often long, are not

quite so thick, giving the walls a finished appearance (fig. 84). The rock is limestone and shows the wear of great age.



FIG. 84.—South side of the causeway several miles west of the opening in the trail.

Where in good condition, the walls resemble those of the temples at Cobá and Yaxuna. At intervals along the road appear pits, surrounded by large stones placed in a circle. Some of the pits are quite large, perhaps fifty feet in

diameter, others are three feet across. These may be the openings of unused cenotes and chultuns (bottle-shape, cemented, underground reservoirs fifteen to twenty feet deep and with openings about three feet across), long since filled by ages of forest humus. These circular depressions may also have been used for heating large blocks of stone, which, when very hot, were split by the application of water. The Maya were extremely religious, and the ease with which present-day Indians gather stones for their fences and walls is foundation for the belief that the ancients did the same thing; but, with a fervor inspired by the desire to appease their deities, they made offerings of faced stones brought to the causeway. Between its retaining walls the causeway is filled with irregularly shaped pieces of white limestone from three inches in diameter to ten or more, forming rubble. There is evidence that this filling, as well as the sides, was once covered with a coating of cement. As the Maya had no domestic animals, the roadway was evidently used for ceremonial purposes alone.

There are several small stelæ along the northern side of this portion of the causeway. Crawford Johnson discovered one standing upright, but its only carving was a line from top to

bottom, with three equidistant transverse lines. Glyphs may have been carved in the spaces, but if so, they have entirely worn away. Another stela was blank, while two others bore illegible inscriptions. These stelæ were about one mile apart and quite small, three of them, found face up, averaging about two feet high by twenty-one inches in width. The blank one was three feet high by twenty inches wide. We searched diligently in the hope of finding others, face down, but were not rewarded.

We camped at a water-hole, which appeared to be natural, on the northern side of the trail. The water was vile, full of contaminating things, and had to be boiled and chlorined; but the Indians drank it "raw." The natives say that beyond the southern side of the road there are many ruins and mounds. There are no trails, however; the bush is very thick and it would have taken many days of hard labor to obtain a view of them, so we abandoned the idea of a visit. Resuming our journey eastward, about four miles from Cobá we passed a ruined temple on the northern side of the causeway, and opposite, on the southern side, we saw a large pile of crumbling ruins, about three hundred feet long, with scarcely a semblance of walls or roof. The causeway at this point takes a sharp upturn

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and runs directly into the ruins, where it is temporarily lost in the fallen buildings (fig. 85). The retaining walls at this point are about ten feet high. Adjoining these ruins on the south are others. With the aid of the Indians I



FIG. 85.—Where the causeway extends into an enormous ruin pile three miles west of Cobá

climbed to the top of a mound, but a crumbling wall resembling the walls at Cobá and Yaxuna is all that I could find. Far to the south I saw another mound. The Indians said that the bush was full of them, and there is no doubt that

in the vast unexplored stretches south of the causeway many unheard-of ruins exist.

Returning from Cobá, where we spent four days, we started on the western part of the causeway nineteen miles west of Cobá, unknown and unexplored. The apparent lack of water has always been the greatest deterrent to its exploration. We were particularly warned as to this situation, but found this unexplored section to be well watered, and there are doubtless many cenotes in the neighborhood of the causeway. The ancient laborers had to have water. We discovered three cenotes during our progress along the trail which we blazed. These are near the causeway and are about five feet wide at the top and from fifty to seventy feet to the surface of the water, necessitating the use of a long rope. There were well founded rumors of a fourth cenote about ten miles ahead.

Future explorers should cut a trail along the side of the retaining walls of the causeway, wherever possible, in order to afford an opportunity to observe stelæ and ruins. After about ten miles of trail-cutting the Indians ran into heavy growths of tangled vines and huge trees. Instructing them to detour, they did so, and brought back information of a fourth cenote and of Indians they had met who said that four

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leagues beyond were great lofty ruins directly on the causeway. This would bring us somewhere in the neighborhood of Tixcacal, Kimil, and Kumil, and would place us about twenty-five miles from the end of the causeway at Yaxuna. About two miles westward from camp a mound or hill appears directly on the causeway, and a mile or so farther there is another. As the Maya always made every effort to keep their causeway level, these mounds, about fifteen feet high, were puzzling. The causeway, rubble and retaining walls, pass up and over them. Every effort was made to discover stelæ.

These mounds are doubtless worthy of full investigation. The Indians complained of the heavy work, and the increasing jungle growth (fig. 86), and began coming in early and playing around. This proved to be too costly, so, abandoning this locality, we started for Yaxuna. We had now sufficient evidence of the course of the causeway for a distance of thirty-seven miles, consequently about thirty-two miles remained unexplored with the exception of seven miles at the Yaxuna end, which Dr. Morley says has been traversed. There is good evidence that the causeway continues to below Tecom, Kaua, and Chebalam. The Indians insist that

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a branch runs to the northwest, leaving the main road south of the village of Chebalam which is not far away, as the map shows, and losing itself entirely east of Chichen Itzá. Perhaps its construction was commenced as Chichen Itzá grew



FIG. 86.—A part of the jungle along the route of the causeway.

in importance and then abandoned during the Toltec invasion.

Returning to the village of Valladolid we had a chance to look around this old colonial town, built on the site of an ancient Maya city. The

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ruins of ancient structures abound; some are the remains of what were once colonial mansions with magnificent gardens. The streets as a whole are well paved, and many automobiles are to be seen. We left the train at Dzitis and climbed aboard a queer hybrid contraption mounted on a Ford chassis very difficult to describe. The drive to Chichen Itzá, twenty or twenty-five miles, takes about an hour and a half. While at Chichen Itzá I climbed the steep stairs of the Castillo, with their narrow treads, from the top of which one obtains a fine view of the surrounding country and of the ruins, which, since their restoration by the Carnegie Institution of Washington, are magnificent. To the south about ten or twelve miles the mounds of Yaxuna are discernible in clear weather by a depressed place between two high mounds. I backed down the steep stairway, but Crawford Johnson, heedless of my warning, tripped rapidly down as if on stairs in his home.

Early the next morning we started for Yaxuna with a guide and one horse, as Crawford insisted on walking most of the eighteen miles by trail, which proved to be the worst we had encountered, for at times thorny vines tore our clothing and scratched our faces until streaked with blood. Dr. Morley, in charge of the Chi-

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chen Itzá excavations, had ordered for us a quantity of delicious sandwiches and had secured the guide and the horse, for which we were most grateful. Pursuing a southeasterly course toward Yaxuna, we passed through the villages of Yula, Necteje, Paxmex, and Ruina Ixmúl, each consisting of a few thatched huts but well provided with water from cenotes. The inhabitants were more friendly than those south of Valladolid. Just before reaching Yaxuna we met a severe rainstorm, drenching us all. On reaching the miserable village of Yaxuna our guide led us to the home of the headman, who had quite a large place enclosed by a fence built of stones doubtless taken from the old causeway. There was a range of rotting thatched huts, and directly in front of a doorway was a huge sow with a squealing litter. Naked children, together with chickens, dogs, and pigs, were running in and out of the doors. A fire was burning in the corner, and we stripped to dry our clothes. No one can comprehend the filthy, insanitary conditions existing around these huts. The floor of the one assigned to us (fig. 87) was covered with smut and ashes. The wife came early to prepare our breakfast of tortillas, half-cooked eggs, and chocolate which she stirred with fingers that alternately reached

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her mouth. We were shown beehives under a thatched shed. These consisted of hollow logs cut in lengths of about two feet, with plugged ends and a small hole bored in the middle (fig.



FIG. 87.—A native dwelling at Yaxuna.

88). A young Maya lad opened a hive and was dragging out the dark-brown honey, some of which contained grub worms which he ate with avidity. The bees are stingless.

Notwithstanding their surroundings, the Maya are slowly progressing in education and dress, particularly those who live around the chicle centers. Many of the younger generation read and write Spanish. A Maya lad had no diffi-

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culty in writing for me, in a legible hand, the names of the villages from Chichen Itzá to Yaxuna. In 1925, while at Tulum on the eastern coast, General Caamul called at our camp accompanied by his son who is at the



FIG. 88.—Bee-hives at Yaxuna. Short hollow logs are plugged at the ends and a hole is bored in the center.

right in fig. 89. General Caamul, who is not shown in the picture, wears a large gold earring in his left ear—the insignia of his rank in the Maya army. A small, sharp-featured man, with piercing eyes, he wore a red and white bandana

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around his head, carried a rifle and a very long machete, and altogether presented a picturesque appearance.

The child shown in the picture appeared on the scene entirely naked, but when posing for



FIG. 89.—Maya Indians of Tulum in 1925.

the camera he modestly covered himself with a piece of gunny-sack. The entire group remained to lunch and seemed to have a good deal to talk about. They were very inquisitive, asking many questions about everything I

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possessed, including their cost. The General seemed to be especially interested in my snake-bite outfit. Through the interpreter I asked him if there were many poisonous snakes around the ruins of Tulum, which elicited the reply, "It is strange he should ask such a question when he must have known they were here or he would not have brought the serpent-bite remedy."

Approaching Yaxuna I beheld on my right an old ruined building, with weeds on the roof, about three hundred yards from the trail. It was late in the afternoon, and as the ruin is on a hill and the bush very thick, I made no attempt to reach it. The structure, which is apparently square or oblong, with walls of faced stone, stands alone and did not look like an example of Maya architecture. It might be the remains of an old Spanish fort—a relic of the war of the castes. I made a photograph, which unfortunately did not turn out well. To the left, on the southern side of the trail, is a large mound heavily overgrown with vegetation. I was told that it had never been visited by explorers. The first building one sees on entering Yaxuna is a picturesque ruined church of the colonial period (fig. 90).

Directly ahead we observed a very high mound

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with a crumbling temple (fig. 91). The causeway extended directly into it and ended there, further search failing to find a trace of it beyond. The walls of the building referred to resemble



FIG. 90.—Ruined church at Yaxuna.

those of Cobá, and with the causeway connecting the two cities they were probably contemporaneous. Our observations showed that the causeway extends from Coba always in the same

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direction, and that the construction is the same throughout. The retaining walls are low,



FIG. 91.—Ruins on a mound at Yaxuna. The causeway enters the ruins and there ends.

owing to the nature of the ground. Except where removed by us, the rubble is covered with

a heavy growth of vine, making travel exceedingly hard and dangerous. We were obliged to walk directly on the road, and frequently would sink in holes up to our knees. These old causeways seem to shelter a great variety of snakes, and one should be cautious. Crawford Johnson came into camp one afternoon with four Indians bearing a pole to which was bound, with vines, a seven-foot *Crotalus terrificus*, or Central American rattlesnake. There are many stone fences around Yaxuna, for the erection of which the Indians doubtless removed great quantities of the rubble from the causeway.

Mr. Martínez stated that there is a stone "idol" at Yaxuna, but we could not locate it and the Indians would not help us to find it. From all I could learn, this "idol" resembles the stelæ at Quirigua.

Eight causeways radiate from Cobá in all directions; the Indians say there are three more. The ancient city was a great religious center, and with Yaxuna, the two were the Mecca and Medina of Yucatan and perhaps of a much vaster territory. Mr. Martínez thinks that ambassadors from other countries came over these causeways with gifts and that messengers brought communications from every direction. He particularly stresses the extension of the

causeway southward in the jungle to no-one-knows-where. There is already evidence that ruins exist in the course of the causeway in that direction.



FIG. 92.—Weathered stelæ at Cobá. The Indians use them as altars, on which candles are burning.

At its eastern end the causeway makes a curve, enters the ruins of Cobá, and ends in a group of mounds to the north. Cobá is buried in heaps of stones. I saw no carvings on its walls. Dr. Kidder suggests that the rough walls were covered with stucco and ornamented with paintings which have completely weathered

away. Two stelæ were observed on the trail from our camp, but they are so worn that their inscriptions are not decipherable (see fig. 92). On two crude altars in front of these stelæ were lighted candles and pieces of burned meat—offerings by descendants of the original sculptors.

Writing especially of the Seneca, Mrs. Converse⁹ has aptly stated:

To those who set aside the Indian religion as a lot of pagan idolatries and heathenish orgies, I suggest a closer study of these people; and the respect that is due the religion that comprehends within its service charity, honesty, family love, tribal loyalty, the belief in a supreme creator and the immortality of the soul! Such is the true religion of all American Indians; and the christianized Indian who comes to the altar of the divine Son, finds there in the Christian's God, the Father, the same Great Spirit of his ancient people, and in the Ten Commandments he realizes with a satisfying comfort the resemblance to the moral code of his ancestors!

Extending east and west on the trail from our camp-site are six tiers of stone steps, 125 feet wide (fig. 93), with vestiges of large temples at each end, the top tier of steps reaching a "plaza" about 200 feet across, flanked with rows of temples and mounds running its full length. The direction of the steps is east-west. The mounds are very high and are surmounted with crumbling walls. With great difficulty I climbed among them and obtained several photographs. So

⁹ *Indian Notes*, January, 1930, pp. 72-73.



FIG. 93.—Stairway in the grand plaza of Cobá.

far as observable, only one room had been decorated with paintings. There are faint traces of a feathered figure, and an imprint of a red hand such as frequently appears on inner walls of the ruined structures. About a hundred feet back in the plaza is another widening plaza with huge ranges of ruined buildings on each side, extending north-south. The rooms of each building are connected by holes, six inches square, through the thick walls. I can not define any possible use for them unless for ventilation or conversation. I saw no rooms that were not thus provided. Some apartments have crypts about two feet square, but they are so choked with fallen stones that they could not be closely examined.

One high mound has a stela in front. With great exertion we climbed to its summit, on which is a ruined temple (fig. 94). This is the mound that Colonel Lindbergh first observed. It has more than a hundred steps from a terrace to the top, from which the view is magnificent. Another stela (fig. 95), is situated on a high terrace, with steps leading to it. There are thirteen stelæ at Cobá. High mounds and temples are to be seen, particularly to the northward, about a mile away, where I observed a mound with a temple that seemed to be about

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two hundred and fifty feet long. The mound on which I stood is perhaps one hundred and



FIG. 94.—Cobá. Temple on a mound.

twenty-five feet high—higher than the loftiest mound at Tikal. It was built on nine terraces



FIG. 95.—Rear side of Stela 1, A.D. 413, at Nohotchmue.

and covers several acres of ground. The grand stairway faces Lake Cobá (see the map and fig. 93). On the eastern side of the grand plaza,

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and about a hundred feet ahead, is another stairway, and another plaza beyond that. The latter plaza is lined with temples (fig. 96), all in a ruinous state, with many different kinds of arches, some of them recalling the arches of



FIG. 96.—Temple on a mound at Cobá.

Tulum. Directly on the edge of Lake Macanxoc there is a flight of wide steps which descend from a large terrace, exceeding two hundred feet square, to the water's edge, where there is a dock of cut white stone. The water in front

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is quite deep, too deep to permit photographs to be taken by wading. The whole structure must have presented a beautiful appearance in ancient times. The bed of the lake in front of this dock is cemented, a fact which may have



FIG. 97.—Lake Cobá, with the high mound at the left.

given rise to the belief of the Indians that the causeway entered the lake. There are apparently the remains of another dock about half a mile from the northern end of Lake Coba, one large stone of which recalls a cut-edge.

There is a ruined temple of the Diving God

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at Cobá, with a large stela in front bearing the date equivalent to 383 A.D. Possibly the steps to the water's edge and the cemented lake-bed may have played a part in some ceremony.

While on the highest pyramid at Cobá I observed a chain of four lakes extending south-east-northwest. The largest of these is Lake Cobá, the smaller or eastern one is called Macanxoc. The ruins of Cobá are between the two lakes, on a strip of land about a mile wide. Lake Cobá is about three-quarters of a mile long and half a mile wide. Lake Macanxoc is curved like a crescent, and there are ruins on the inner side of the curve. The remaining two lakes, which are quite small, lie at the extreme northwesterly end of the group. They were all atolls of the ocean at some remote geological period. Their shallow shores are lined with sharp white coral rocks, and are bordered with tall reeds and other aquatic plants. Alligators are abundant in all of them, particularly Lake Macanxoc, and small edible fish are to be had in Lake Cobá. The Indians waded out to their waists and with short lines seem to have very little trouble in catching them. Frogs croak at all hours, and with the bellowing of alligators at night, the din may be imagined. Many varieties of birds abound;

some, with stiltlike legs, stalk among the reeds. Anyone who expects to live off the country which we visited will be doomed to disappointment, as there is a scarcity of animals, but the vegetation is more luxuriant than in Yucatan generally.

Cobá might be called a "city of decomposed water"; indeed the name means "decomposed water" in Maya, for the shallow waters of the lakes are undrinkable without chlorination. The lakes should be carefully searched, particularly around the dock at Lake Macanxoc, at the foot of the flight of wide steps at the water's edge. Canoes, dugouts, and barges were doubtless in use, and during the course of centuries accidents were bound to have occurred, hence it may be supposed that many trinkets, tools, insignia of office, and weapons of all sorts were lost and now lie beneath a vast accumulation of mud. On the walls of Chichen Itzá are drawings of canoes, hence we may presume that there were boat-races and other kinds of aquatic sports. The terraced steps at Lake Macanxoc could have been used as seats for crowds of spectators to witness such sports, as well, perhaps, as religious ceremonies to the Diving God. Large numbers of people must have been drawn to these lakes from the surrounding

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country, and with the causeway in perfect condition, smoothly covered with white cement, the whole scene must have presented a wonderful spectacle.

The remains of Cobá, Yaxuna, and the causeway form another link in the story of the Maya. The causeway seems to prove that these "Old Empire" sites were contemporaneous. The fact that Chichen Itzá has no road approaching it would seem to indicate that it was not an important center during the Cobá-Yaxuna periods. Perhaps it was colonized from Cobá. Archeologists date Cobá at least 1,500 years in the past, the height of Chichen Itzá's glory at less than half that time, and the ultimate abandonment of the site at only thirteen years before the coming of Columbus.

RECENT ACCESSIONS BY GIFT

From Mr. J. Neilson Barry:

Chipped spearpoint. Near Joseph, Wallowa county, Oregon.

From Captain Robert R. Bennett:

Nine photographs.

From Miss Leah Frances Collins:

Five pieces of pottery. Valley of Mexico, Mexico.

From Mr. Edward H. Davis:

White glass beads; red glass beads with black center; cylindrical blue glass beads. Mariposa county, California.

Bundle of sea-lion whiskers.

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From Mr. H. E. Deats:

Wooden mask. Yaqui. Arizona.

From Mrs. Marie Luise J. de Barreto:

Nine photographs.

From Mr. John Delany:

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From Mrs. Alice L de Santiago:

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From Miss Emily C. Fergusson (through the courtesy of Mrs. Allen B. Cuthbert):

Fifty-six photographs, largely of Pueblo Indian subjects.

From Miss Ruth Gaines:

Base of pottery vessel. Red Springs, Robeson county, North Carolina.

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Eleven newspaper clippings.

From Mr. Albert G. Heath:

Iron awl with wooden handle. Makah. Washington.

Oval wooden salt dish; wooden mallet; fiber bag.

Ottawa. Michigan.

Three knife- and scraper-points. Ross county, Ohio.

Chipped knife-blade. Portage county, Ohio.

Pitted hammerstone, showing use as smoother.

Adams county, Illinois.

Pitted hammerstone; chipped implement blank.

Calhoun county, Illinois.

Nine arrow-, knife-, and spear-points. Red Bay, Franklin county, Alabama.

Hematite pendant. Iron county, Missouri.

Arrowpoint. Tenmile, Washington county, Pennsylvania.

Chipped hoe. Overton county, Tennessee.

Human vertebra stained with copper salts. Emmet county, Michigan.

Cornhusk doll. Oneida. Wisconsin.

Rush bag decorated with purple. Chippewa. Minnesota.

From Mr. Roger Hervé:

Three photographs.

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From Mrs. Thea Heye:

Gourd vessel, incised decoration. Lengua Indians. Paraguay.

Funeral urn representing seated human figure wearing an animal mask, painted white. San Juan Guelache, District of Etla, Oaxaca, Mexico.

Funeral urn representing human head with ornate headdress, black ware. San Lorenzo Cacautepec, District of Etla, Oaxaca, Mexico.

Funeral urn representing seated human figure, black ware, traces of red and white painted decoration. District of Etla, Oaxaca, Mexico.

Pottery box, buff ware, with broken figures in relief on sides, cover missing; used as funeral urn. San Jacinto Amilpas, District del Centro, Oaxaca, Mexico.

Slab of jadeite, carved to represent three seated human figures. Oaxaca, Mexico.

Cylindrical wooden stand, inlaid with shell, for shell cup; large oval black stone dish. Cuzco, Peru.

Two red bivalve shells drilled for suspension. Nasca, Peru.

Dipper, gray ware, black painted decoration: small jar, gray ware, black painted decoration; animal fetish of brown stone; perforated animal fetish of black stone; triangular pottery pendant incised on edge, red ware; small piece of worked white stone; spiral pottery ornament, from vessel, gray ware. Ruin of Tomanah (Taptana), four miles west of Hawikuh, Zuñi reservation. New Mexico.

Woven sash, yellow and gray decoration. Zuñi. New Mexico.

Crude steatite pipe. Union county, South Carolina.

Two haliotis-shell discs. Catalina island, California.

Net-sinker.

Two horn spoons. Mandan. North Dakota.

Seated pottery human figure holding bowl, gray ware, red and blue painted decoration; pottery female human figure, gray ware, gold and black painted decoration; pottery animal figures, gray ware, red and blue painted decoration; small gourd rattle, traces of red and blue painted decoration. Tesuque. New Mexico.

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From Mr. Joseph A. Imhoff:

Woven bag. Chippewa. Michigan.

From Mr. Ernest Ingersoll:

Basket. Suquamish. Washington.

Burden basket. Hupa. California.

Basketry water-bottle. Paiute. Nevada.

Shallow rectangular basket. Salish. Fraser river, British Columbia.

Basket; basket tray. Pomo. California.

Bark box with curved base. Makah. Washington.

From Mrs. Elizabeth Bishop Johnson:

Gourd rattle painted in various colors with handle decorated with pine branches; hand wand, used in dance, consisting of half a gourd, painted in various colors, with handle. Zuñi, New Mexico.

From H. R. Mallinson and Company, Incorporated:

Eight fabric designs.

From Mr. Albert Morgan:

Pitted hammerstone; notched hoe. Susquehanna river, near Binghamton, Broome county, New York.

From Natural Resources Intelligence Service:

Nine maps: New Brunswick, Prince Edward Island, Moncton, Truro, Yarmouth, Halifax, Cape Breton, Bonaventure, Gaspé.

From Oshkosh (Wis.) Public Museum:

Eighty potsherds.

From Mr. C. Henry Pease:

Iron ax-head; iron arrowhead, perforation in base; celt; two arrow- and knife-points. Fleming, Cayuga county, New York.

From Mr. Jacob Rosenzweig (in memory of Alanson B. Skinner):

Boat-stone. Southeast side of Hunters island, New York, New York.

From Mr. Blair S. Williams:

Wampum belt of white beads with two stripes of purple beads; five strings of white wampum tied together; fragment of a very wide wampum belt of white beads, edged with purple beads; thirteen short strings of white and purple wampum. Mo-

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hawk. Ontario, Canada. (See pages 320-324 of the current number of *Indian Notes*.)

From Mr. L. Winternitz:

Five photographs, "Redwing." Cherokee.

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NOTES

THE death on May 5th, 1930, of Dr. James B. Clemens has again brought to the Museum an irreparable loss among those who originally were instrumental in its establishment and growth. Through the interest of Dr. Clemens, the brother-in-law of the Director, a department of Physical Anthropology was established in 1915, but by reason of the interruption of scientific research on account of the World War, it did not become very active until 1920, since which time it has been an integral part of the Museum. Dr. Clemens not alone established the department, but generously provided the means and encouragement necessary to the achievement of its aims.

THE tragic ending of a promising career came on May first when Crawford Johnson was killed in a motor accident near Washington. Mr. Johnson, only son of Charles H. and Edna Crawford Johnson, of Washington, was born

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February 22, 1910, and attended the Friends Select School and the National Cathedral School at Washington and St. George's at Newport. Evincing from childhood a strong desire for travel and exploration, in the summer of 1929 he became a member of a survey party of the United States Coast and Geodetic Survey, and last spring accompanied Captain Bennett on his expedition for the Museum to explore the ancient causeway described in the present issue of *Indian Notes*. Notwithstanding the difficulties of travel in a tropical jungle, Mr. Johnson proved himself a personable companion and a capable and untiring explorer, while his deep interest in the ancient remains observed during the journey presaged great promise in archeological work, but which came to a close in such an untimely way.

POST-CARDS IN COLOR, ILLUSTRATING PHASES OF INDIAN LIFE AND ART

THE MUSEUM now has for sale, at fifty cents per set, two sets of colored post-cards, one set of a dozen illustrating archeological and the other set ethnological subjects. For each set there is a special envelope, appropriately embellished with an Indian design in colors. The cards themselves, which are beautifully printed by the Helio-type process, illustrate the following subjects.

Archeological Subjects

1. Prehistoric pottery vessel from an excavation in San Salvador, Republic of Salvador.
2. Prehistoric cylindrical Mayan jar from Yascaran, Honduras.
3. Decorated double-mouthed bottles of the prehistoric Nasca culture of Peru.
4. Prehistoric effigy vase from Nicoya, Costa Rica.
5. Jars from the prehistoric ruins of Casas Grandes, Chihuahua, Mexico.
6. Prehistoric vessel embellished with painted patterns and with human effigies, from Recuay, Peru.
7. Effigy vessel from Mississippi county, Arkansas.
8. Earthenware incense burner from British Honduras.
9. Sculptured alabaster vase from Honduras.
10. Ancient carved and painted mirror from Peru.
11. Carved stone receptacle from the Valley of Mexico.
12. Jade chisels from Alaska.



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Ethnological Subjects

13. Human bodies shrunk after the removal of all the bones by the Jivaro Indians of Tierra Oriente, Ecuador.
14. Head-dress, wands, and whistles used in ceremony by the Hupa Indians of California.
15. Deerskin coat, decorated in painted and rubbed designs. Naskapi Indians of northeastern Canada.
16. Sioux shirt made of deerskin, decorated with porcupine-quills, scalp-locks, and painted lines.
17. Ceremonial mask of carved and painted wood. Auk division of the Tlingit of southern Alaska.
18. Head-dress and wands used in a Corn dance by the Zuñi Indians of New Mexico.
19. Shirt woven of mountain-goat wool, used in ceremony by the Chilkat Indians of Alaska.
20. Feather head-dress worn by the Caraja Indians of Rio Araguaya, States of Matto Grosso and Goyaz, Brazil.
21. A typical tipi of the Indians of the northern plains.
22. Jivaro Indian in dance regalia. Ecuador.
23. Pueblo water-jars from Acoma and Zuñi, New Mexico.
24. A small plaza of Zuñi pueblo, New Mexico, during the performance of a Rain dance.

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